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PERFORMANCE OF SUPER EARLY PIGEONPEA UNDER DIFFERENT DATES OF SOWING IN SOUTHERN TELANGANA ZONE OF INDIA

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ABSTRACT

The field experiments were conducted during *kharif*, *rabi* and *summer* seasons (year round) in 2018-19 and 2019-20 to determine the growth, yield parameters and yield of super early pigeonpea under different sowing windows at Regional Agricultural Research Station, Palem, Telangana, India situated at 16˚ 51' N Latitude and 78º25' E Longitude with an average Altitude of 478 m above the mean sea level of Southern Telangana Zone of Telangana State, India. The experiment was laid out in a simple RBD for pigeonpea with 24 treatments: sowing of super early pigeonpea every fortnight from June 15th (T1) of the present year to June 1st (T24) of the succeeding year. Treatments were replicated thrice. The findings of two years of field study revealed that, sowing of super early pigeonpea on June 15th (T1) has recorded more growth, yield parameters and yield compared to other remaining sowing dates in year. Inconclusion the adaptability of superearly pigeonpea is mostly suitable for June 15th sowing date and completes its duration 100-110 days to enables to go timely sowing of the *rabi* crop.
***Keywords* :** Super early pigeonpea, sowing window.

Introduction

Pigeonpea (*Cajanus cajan* (L.) Millsp.) is one of the most important grain legumes cultivated in tropical and subtropical regions of the world, particularly in Asia, Africa, and Latin America. It plays a crucial role in ensuring food and nutritional security due to its high protein content and supports healthy human life. They help in maintaining heart health, proper digestion and blood sugar levels of humans (Singh 2017) also help in sustainable agriculture, enhancing soil fertility and reducing greenhouse gas emissions (FAOSTAT 2024). In addition to its nutritional importance, pigeonpea contributes significantly to soil fertility through biological nitrogen fixation and improves the sustainability of cropping systems (Kumar *et al.*, 2021). India is the largest producer and consumer of pigeonpea, accounting for a major share of global production, where it is grown both as a sole crop and in intercropping systems with cereals and millets (Singh *et al.*, 2016). An increase in pulse production is required to maintain nutritional security in India (Sah *et al*. 2024).

Traditionally, pigeonpea varieties are medium to late in maturity, requiring about 150–210 days to complete their life cycle. However, changing climatic conditions, increasing pressure on land resources, and the need for intensified cropping systems have led to a growing demand for short-duration cultivars (Kumar *et al*., 2022). The Photo and thermo-sensitivity of existing pigeonpea cultivars is also another drawback restricting the horizontal expansion to different cropping systems in varied agro-ecologies (Kumar *et al*., 2022). Early and extra-early pigeonpea varieties offer advantages such as escape from terminal drought, reduced exposure to pests and diseases, and better adaptability to multiple cropping systems (Reddy *et al*., 2003). In this context, the development of super early pigeonpea genotypes, maturing within 90–120 days, has emerged as a promising technological breakthrough. Super early pigeonpea varieties developed from ICRISAT are of 100 days duration with yield potential of 0.6-1.5 t ha^{-1} (Vales *et al*., 2012; Kumar *et al*., 2015). Yield maximization of super early pigeonpea and its cropping system depends on the optimum time of sowing

Super early pigeonpea varieties provide an advantage to farmers to incorporate pigeonpea into various diverse cropping systems, including rice fallows and sequential cropping patterns. These varieties are very much suitable for rainfed regions as there will be a limited length of the growing season. They allow timely sowing of subsequent crops such as wheat, chickpea, and vegetables, thereby enhancing cropping intensity and farm income (Kumar *et al*., 2012) and also other crops like Sorghum, groundnut and maize. Moreover, super early genotypes help in escaping terminal moisture stress and are better suited to areas prone to erratic rainfall and climate variability. In addition to this an important advantage of super early pigeonpea is its compatibility with mechanized farming due to uniform maturity and shorter plant stature. These features reduce labor requirements and facilitate efficient mechanical harvesting. Additionally, early maturity reduces the risk of crop loss due to adverse weather conditions at later stages, thereby improving yield stability (Rai *et al*., 2019). Despite these benefits, the adoption of super early pigeonpea is limited by a relatively narrow seed availability, lower yield potential compared to long-duration types, susceptibility to certain pests and diseases, and the acceptability of super early pigeonpea in the market.

Therefore, there is a need to strengthen agronomic programmes aimed at incorporating super early pigeonpea in cropping systems through understanding the adaptability super early pigeonpea in different sowing windows in a year for improving cropping system yield, terminal drought stress avoidance, and marketability of super early pigeonpea. Expanding genetic variability and developing climate-resilient cultivars will be critical for enhancing the productivity and sustainability of pigeonpea-based systems. In this context, as super early pigeonpea holds immense potential to meet future challenges of food security, climate change, and sustainable agriculture a detailed study of the productivity of super early pigeonpea with various sowing dates in a year.

Materials and Methods

A field experiment was executed at Regional Agricultural Research Station, Palem, Nagarkurnool, Southern Telangana Agro Climatic Zone of Telangana State during *kharif, rabi and summer* seasons *of* 2018-19 and 2019-20 to study the performance of super early pigeonpea in different sowing windows. The experimental location exists in sub tropical conditions of India and situated at about 16˚ 51’ N latitude and 78º25’ E longitude with an average altitude of 478 m above the mean sea level. The soil of the experimental site was sandy clay loam with pH 6.7, electrical conductivity 0.34 dSm^{-1}, low organic carbon (0.52%), low available nitrogen (201.3 kg ha-1), medium phosphorus (16.7 kg ha^{-1}), and high in potassium (309.4 kg ha^{-1}).

The germplasm used for this evaluation was the super-early photo-insensitive cultivar ICPL 20325. Super early photo insensitive cultivar ICPL 20325 pigeonpea is non determinate type (NDT) and it comes to maturity in 90-100 days to open the avenue to explore during the off season and in non-traditional eco systems (Shruthi *et al*., 2020). This photo insensitive crop is being hardy and early fits in rice fallows, wheat-pulses and sugarcane-pulses intercropping system using residual moisture for growth and development (Hingane *et al*., 2018). The seeds @ 10 kg ha^{-1} was hand dibbled at the rate of 2 seeds $hill^{-1}$ by adopting spacing of 30 cm ×15 cm. The treatments were 24 dates of sowing viz., T1- June 15th, July 1st, July 15th, August 1st, August 15th, September 1st, September 15th, October 1st, October 15th, November 1st, November 15th, December 1st, December 15th, January 1st, January 15th, February 1st, February 15th, March 1st, March 15th, April 1st, April 15th, May 1st, May 15th, and June 1st and these treatments were replicated thrice in Randomized Block Design. Recommended fertilizer dose of 20 kg nitrogen (N), 50 kg phosphorus (P_2O_5), and 20–25 kg potassium (K_2O) per hectare was applied. Hand weeding followed by mechanical weeding was practiced at 20 DAS and 35 DAS. Application of plant protection chemicals was performed based on necessity.

The meteorological data recorded during the experimental period i.e., 2018-19 and 2019-2020 indicated considerable variation in temperature, relative humidity, rainfall, sunshine hours and evaporation across different months and presented in following Table 1 & 2.

Table 1 : Month-wise weather parameters recorded in 2018-19

Month	Temperature (^{O}C)		Relative Humidity (%)		Rain fall (mm)	Rainy Days	Sun shine hours	Evopora tion (mm)
	Max	Min	RH_1	RH_2				
June, 2018	35.6	22.8	84.3	46.7	59.0	6.0	5.5	6.9
July, 2018	31.7	20.7	89.8	58.4	93.0	9.0	3.1	5.1
August, 2018	29.7	20.1	90.1	65.7	121.2	10.0	2.7	4.2
September, 2018	33.1	20.5	89.1	56.1	108.2	4.0	6.4	5.8
October, 2018	33.3	18.8	87.1	51.4	16.6	1.0	6.9	5.9
November	32.4	16.4	83.8	40.8	1.2	0.0	9.0	4.9
December, 2018	29.7	15.4	87.5	54.0	0.0	0.0	5.8	3.9
January, 2019	29.4	12.5	85.0	41.9	25.4	2.0	9.0	3.7
February, 2019	33.6	17.0	79.8	38.3	0.0	0.0	9.3	5.2
March, 2019	37.3	19.1	78.1	31.8	0.0	0.0	7.7	7.6
April, 2019	40.1	22.8	79.0	30.8	0.0	0.0	7.9	10.1
May, 2019	41.2	25.1	75.1	30.3	46.0	3.0	7.9	11.8

The maximum temperature ranged from 29.4°C in January, 2019 to 41.2°C in May, 2019, while the minimum temperature varied between 12.5°C and 25.1°C during the same period. Lower temperatures prevailed during December and January, whereas higher temperatures were observed from March to May. Relative humidity also showed marked fluctuations. Morning relative humidity (RH_1) remained comparatively high throughout the year and ranged from 75.1 to 90.1 per cent. The highest RH_1 was recorded during August, 2018 (90.1%), coinciding with the monsoon season. Evening relative humidity (RH_2) varied from 30.3 to 65.7 per cent, with higher values during the rainy season and lower values during summer months. Rainfall distribution revealed that the majority of precipitation was received during the monsoon months from June to September. The highest rainfall of 121.2 mm was recorded in August, 2018 followed by 108.2 mm in September, 2018. No rainfall was received during December, February, March and April. The number of rainy days was also maximum during August (10 days) and July (9 days).

Sunshine hours varied from 2.7 to 9.3 hours per day. Minimum sunshine hours were recorded during August due to cloudy weather conditions associated with monsoon rains, whereas maximum sunshine hours were observed during February. Evaporation values ranged from 3.7 mm in January to 11.8 mm in May. Lower evaporation during winter months was mainly due to reduced temperature and solar radiation, while higher evaporation during summer months was attributed to increased temperature and bright sunshine hours.

Overall, the weather conditions during the study period represented typical semi-arid tropical climatic conditions with distinct monsoon, winter and summer seasons.

Table 2 : Month-wise weather parameters recorded in 2019-20

Month	Temperature (^{O}C)		Relative Humidity (%)		Rain fall (mm)	Rainy Days	Sun shine hours	Evopo ration (mm)
	Max	Min	RH_1	RH_2				
June, 2019	37.6	22.6	84.6	41.6	84.6	4.0	6.3	7.6
July, 2019	32.0	19.9	92.0	268.8	167.8	13.0	2.9	5.1
August, 2019	30.8	19.2	91.1	65.5	116.0	7.0	3.0	4.7
September, 2019	29.8	18.8	91.8	69.0	123.0	10.0	3.3	3.8
October, 2019	30.3	18.2	93.5	67.5	133.8	13.0	5.6	4.1
November, 2019	30.5	16.3	90.4	61.5	31.8	2.0	7.4	4.5
December, 2019	29.3	13.4	88.3	55.2	0.0	0.0	7.1	3.7
January, 2020	30.9	13.8	84.9	47.2	12.2	1.0	8.3	4.3
February, 2020	32.0	13.5	85.1	40.0	0.0	0.0	9.0	5.3
March, 2020	35.8	18.0	85.9	42.7	0.0	0.0	7.6	5.9
April, 2020	38.3	20.3	80.5	34.4	24.0	1.0	6.9	7.3
May, 2020	39.9	23.2	86.2	34.3	9.2	1.0	7.8	7.7

The maximum temperature ranged from 29.3°C in December, 2019 to 39.9°C in May, 2020, while the minimum temperature varied from 13.4°C to 23.2°C during the study period. Relatively lower temperatures prevailed during December to February, whereas higher temperatures were observed from March onwards, reaching the peak during May. Morning relative humidity (RH_1) remained high throughout the year and ranged between 80.5 and 93.5 per cent. The highest RH_1 was recorded during October, 2019 (93.5%), while the lowest was observed during April, 2020 (80.5%). Evening relative humidity (RH_2) varied from 34.3 to 69.0 per cent. Higher RH_2 values were recorded during the monsoon period due to increased atmospheric moisture, whereas lower values were noticed during summer months. Rainfall distribution indicated that the major portion of rainfall was received during the southwest monsoon season extending from June to October. The highest rainfall of 167.8 mm was recorded during July, 2019 followed by 133.8 mm in October, 2019 and 123.0 mm in September, 2019. No rainfall was received during February and March, 2020. The maximum number of rainy days was observed during July and October (13 rainy days each). Sunshine hours ranged from 2.9 to 9.0 hours per day. Minimum sunshine hours were recorded during July due to cloudy and rainy weather conditions, whereas maximum sunshine hours were observed during February, 2020. Evaporation values varied from 3.7 mm in December, 2019 to 7.7 mm in May, 2020. Lower evaporation during winter months was mainly due to lower temperature and reduced solar radiation, while higher evaporation during summer months was associated with increased temperature and bright sunshine.

Observations on days to 50% flowering, Days to 75 % pod maturity, plant height at harvest (cm), Number pods per plant, seed yield (kg ha^{-1}) and 100 seed weight (g) were recorded in 2018-19 and 2019-20. Daily weather data such as rainfall, maximum and minimum temperatures, relative humidity, evaporation wind speed and sunshine during crop period were collected through agrometerological observatory of the university. All the experimental data were tabulated and statistically analysed following the procedure described by Panse and Sukhatme (1978). The significance of treatment effects was tested by the 'F' test at 5 per cent level of probability. Whenever the F-test indicated significant differences among treatments, the treatment means were compared using Critical Difference (CD) values at the same probability level.

The statistical model adopted for the analysis was:

$$Y_{ij} = \mu + t_i + r_j + e_{ij}$$

where

- Y_{ij} Observation recorded from the i^{th} treatment in the j^{th} replication
- μ =general mean
- t_i = effect of the i^{th} treatment
- r_j = effect of the j^{th} replication
- e_{ij} = experimental error associated with the observation

The Standard Error of Mean [SE(m)] and Critical Difference (CD) at 5 per cent probability level were calculated for comparison of treatment means.

Results and Discussion

Days to 50 % Flowering and maturity

The data pertaining to days to 50 % flowering and maturity of super early pigeonpea from the years 2018-19 and 2019-20 were analyzed and presented in the Figure 1 & 2

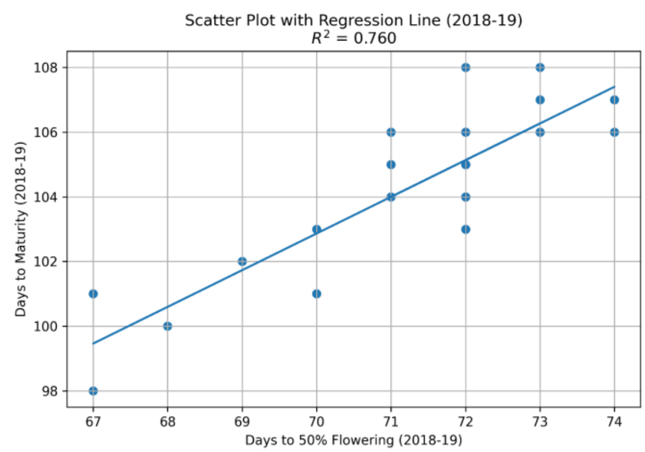

Fig. 1 : Days to 50 % flowering and maturity of super early pigeonpea from the years 2018-19

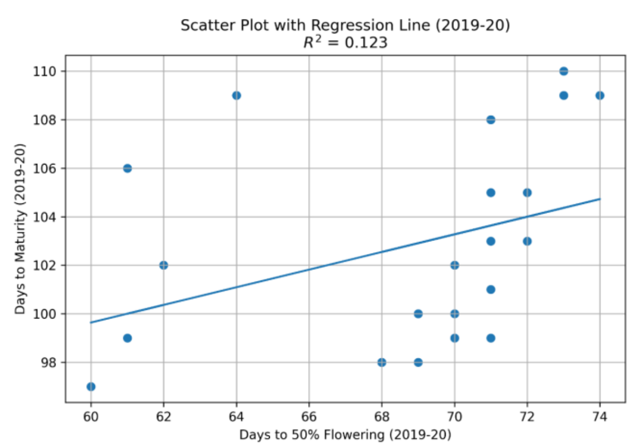

Fig. 2 : Days to 50 % flowering and maturity of super early pigeonpea from the years 2019-20

The scatter plot for 2018–19 showed a positive relationship between days to 50% flowering and days to maturity. Treatments that took more time to attain 50% flowering generally required a longer duration to reach maturity. The regression line indicated a gradual increasing trend, suggesting that flowering duration had a direct influence on crop maturity. Early flowering treatments such as April sowings matured earlier, whereas crops sown during June to September exhibited relatively longer crop duration. The coefficient of determination (R^2) obtained from the regression analysis indicated the extent of association between flowering and maturity duration, showing that maturity was moderately influenced by flowering time during 2018–19.

Similarly, the scatter plot for 2019–20 also revealed a positive linear association between days to 50% flowering and days to maturity. Treatments with delayed flowering tended to exhibit delayed maturity. However, compared to 2018–19, the spread of observations was relatively wider, indicating greater variability among sowing dates during 2019–20. The regression trend line demonstrated that increases in flowering duration were accompanied by corresponding increases in maturity duration. Higher flowering duration observed in late kharif and rabi sowings resulted in comparatively prolonged maturity periods. The R^2 value indicated a reasonably good fit of the regression model, confirming that days to flowering significantly contributed to variation in crop maturity during the second year as well.

Overall, both years demonstrated that phenological development of the crop was strongly influenced by sowing dates, and days to 50% flowering served as an important predictor of maturity duration. The positive regression trend in both years suggested synchronization between reproductive development and total crop duration under varying seasonal environments.

The positive relationship observed between days to 50% flowering and days to maturity in the present scatter plots is supported by several earlier studies in pigeonpea. Agronomy Researchers reported that delayed flowering generally leads to delayed maturity due to prolonged vegetative and reproductive phases under varying environmental conditions. Kuldeep Kumar *et al*. (2022) observed a strong positive correlation between days to flowering and days to maturity in short-duration pigeonpea genotypes. Similarly, Shahsank *et al*. (2025) reported that sowing dates significantly influenced flowering and maturity duration, with delayed sowing reducing crop duration because of variations in temperature and rainfall distribution.

Studies conducted by Carberry *et al*. (2001) demonstrated that flowering and maturity behavior in pigeonpea are strongly governed by temperature and photoperiod, and changes in sowing dates alter crop phenology considerably. Balakrishnan and Natarajaratnam in 2023 also reported that delayed sowing resulted in earlier flowering and shorter maturity duration in pigeonpea due to environmental influences on crop development. Recent findings by Pashawar *et al*. (2024) further confirmed that sowing time significantly affects crop phenology, agrometeorological indices, and yield performance in pigeonpea.

Growth, yield parameters and yield: The data indicated considerable variation in plant height, number of pods per plant, 100-seed weight, and seed yield across different sowing dates during both 2018–19 and 2019–20 were presented in Table 3. In general, earlier sowings from mid-June to July recorded taller plants, higher pod numbers, and greater seed yield compared to late sowings. During 2018–19, the highest plant height (85.0 cm), pod number (27.9 pods plant^{-1}), and seed yield (478 kg ha^{-1}) were observed in crops sown during June and early October, whereas delayed sowings from March to May produced shorter plants, fewer pods, and lower seed yields. Similarly, during 2019–20, June sowing recorded maximum plant height (109.0 cm) and highest seed yield (992 kg ha^{-1}), while later sowings showed gradual reductions in growth and productivity. The reduction in plant height and yield under delayed sowing may be attributed to shortened vegetative growth period and exposure of reproductive stages to unfavorable temperature and moisture conditions.

The results resented in Table 3. clearly demonstrated that sowing dates markedly influenced crop growth, yield attributes, and seed yield of pigeonpea during both years of experimentation. Considerable variation in plant height was observed among the sowing treatments, In 2018-19 significantly highest plant height was recorded June 15th sown super early pigeonpea with 85.0 cm and was atpar with July 1st sown (83.1 cm) but the plant height was recorded gradually decreasing as the sowing dates are delayed. Similar trend was observed in 2019-20. Highest plant height was recorded with June 15th sowing with 109.0 cm, and it was at par with July 1st (106.2) and July 15th (105.4 cm) sowing dates. There was decreasing phenomina was noted in later sowing dates. With this results it can be discussed that, Super early pigeonpea sown during June and July attained greater plant height compared to later sowings. Early sowing provided congenial environmental conditions such as optimum temperature, sufficient soil moisture, and longer photoperiod during the vegetative phase, which promoted cell elongation, leaf area expansion, and dry matter accumulation. Enhanced vegetative growth under early sowing ultimately resulted in greater assimilate production and better translocation towards reproductive organs. In contrast, delayed sowing exposed the crop to suboptimal environmental conditions, shortened the vegetative period, and reduced photosynthetic activity, thereby restricting plant growth. Similar observations were reported by Singh *et al*. (2022), who stated that temperature and photoperiod significantly regulate pigeonpea growth and development under varying sowing environments.

The number of pods per plant, which is one of the most important yield-contributing characters, also varied significantly across sowing dates. In 2018-19 higher pods per plant was noted for 1st October (27.9) sown pigeonpea and it was at par with 15th September (26.9), 15th June (26.0) and 15th October sowing dates (24.3). whereas in 2019-20 highest pods were seen for timely sown super early pigeonpea than the delayed sowings. 15th June sown crop has recorded 29 pods per plant and it was significantly superior over other sowing dates. Higher pod numbers recorded in early sowings may be attributed to better branching, enhanced flower production, and improved pod retention resulting from favorable climatic conditions during flowering and pod initiation. Early-sown crops generally experience moderate temperatures and adequate moisture availability during reproductive stages, which improve pollen viability and fertilization, leading to higher pod set. On the other hand, delayed sowings are often subjected to terminal moisture stress and temperature fluctuations during flowering, resulting in flower shedding, poor pod development, and lower sink capacity. The reduction in pod number under delayed sowing has also been reported by Reddy *et al*. (2013) and he observed late sowing adversely affects reproductive efficiency and pod development in pigeonpea.

The 100 seed weight was not influenced by early or timely sowing in red gram. However, 15th October sown pigeonpea (9.3) recorded highest 100 seed weight over the other sowing dates. The 100 seed weight was fond more for 1st July (9.1), 1st September (9.1) and later the weight of seed is progressively decreased with delayed sowing. The 100-seed weight showed comparatively lesser variation across sowing dates, suggesting that seed size is relatively stable and genetically controlled. Nevertheless, slight reductions in test weight under delayed sowing could be due to reduced assimilate availability during seed filling caused by high temperature stress and shortened reproductive duration. Bajaj *et al*. (2023) observed that terminal heat stress during reproductive stages significantly reduced seed filling duration, seed weight, and overall productivity in pigeonpea. Likewise, Cheboi *et al*. (2024) reported that exposure of pigeonpea to moisture and temperature stress during pod filling impaired photosynthesis and dry matter partitioning, leading to poor grain development and reduced test weight.

Seed yield exhibited a declining trend with delay in sowing during both years. In 2018-19, The highest seed yield recorded under June 15th (478 kg ha^{-1}) and it was atpar with 1st July (463 kg ha^{-1}), 15th July (422 kg ha^{-1}), 1st August (463 kg ha^{-1}), 15th October (451 kg ha^{-1}) and 1st November (436 kg ha^{-1}). In 2019-20, the highest seed yield was noticed with 15th June sowing (992 kg ha^{-1}) and was followed by 1st July sowing (861 kg ha^{-1}). These results may be due to the cumulative effect of superior growth parameters and yield attributes such as taller plants, increased pod number, and better dry matter partitioning. Early sowing allows the crop to utilize monsoon rainfall efficiently and complete sensitive reproductive stages under favorable environmental conditions. Conversely, late sowing exposes the crop to higher temperatures and moisture stress during grain filling, which reduces assimilate translocation and shortens the grain development period. The reduction in seed yield under delayed sowing was more pronounced during 2018–19 than in 2019–20, indicating year-to-year climatic variation and differential crop response to environmental conditions. Similar findings were reported by Chauhan *et al*. (2009), who emphasized that delayed sowing significantly decreases biomass accumulation and grain yield in pigeonpea due to reduced crop duration and stress during reproductive stages. Dahariya *et al* (2018) and Egbe *et al.* (2013) also found similar trend.

Conclusion

The findings of the present investigation indicate that optimum sowing during June and July creates favorable agro-climatic conditions for vegetative growth, reproductive development, and yield formation in pigeonpea. Delayed sowing beyond September adversely affects crop performance because of reduced growth duration and exposure to environmental stress during critical growth stages. Therefore, timely sowing is essential for maximizing productivity and efficient utilization of available environmental resources in pigeonpea cultivation.

Table 3 : Performance of super early pigeonpea at different dates of sowing during the year 2018 & 2019.

Treat ments	Date of sowing	Days to 50% flowering		Days to maturity		Plant height (cm)		No of pods per plant		100 Seed weight (g)		Seed yield (kg ha^{-1})	
		2018-19	2019-20	2018-19	2019-20	2018-19	2019-20	2018-19	2019-20	2018-19	2019-20	2018-19	2019-20
T1	15th June	73	60	107	97	85.0	109.0	26.0	29	8.6	8.7	478	992
T2	1st July	72	61	105	99	83.1	106.2	23.9	26	8.5	9.1	463	861
T3	15th July	74	62	107	102	75.1	105.4	22.9	26	8.4	9.0	422	719
T4	1st August	74	61	106	106	76.4	102.9	22.1	22	9.1	8.9	463	673
T5	16th August	73	64	108	109	65.3	101.1	20.4	22	8.6	9.0	327	644
T6	1st September	72	71	108	108	63.4	98.5	24.2	22	8.6	9.1	327	593
T7	15th September	71	73	106	110	56.3	92.3	26.9	21	8.9	8.9	397	504
T8	1st October	72	73	104	109	64.7	78.7	27.9	19	8.2	7.2	305	359
T9	15th October	72	71	105	108	63.2	63.2	24.3	18	9.3	7.4	451	443
T10	1st November	73	74	106	109	51.9	55.4	23.5	17	8.9	7.4	436	374
T11	17th November	72	71	106	105	47.5	53.2	19.7	17	8.5	7.3	356	366
T12	1st December	72	72	105	105	53.7	51.9	21.3	17	8.3	7.4	363	362
T13	15th December	73	71	106	103	56.7	55.5	19.9	16	8.9	7.4	335	351
T14	2nd January	71	69	104	100	54.3	52.9	20.3	16	8.1	7.2	354	347
T15	16th January	72	68	105	98	58.3	51.1	19.9	17	8.0	7.1	343	359
T16	1st February	72	70	104	100	47.3	49.1	20.5	18.1	8.4	8.0	367	363
T17	15th February	72	71	103	99	47.3	48.1	19.4	18.0	8.0	8.1	391	342
T18	1st March	70	69	103	98	46.8	47.6	17.3	17.6	8.7	8.2	318	336
T19	15th March	70	68	101	98	44.9	46.9	16.1	17.1	8.1	8.0	347	347
T20	1st April	68	70	100	99	43.5	45.2	14.5	16.5	8.3	8.4	306	353
T21	15th April	67	69	98	100	42.5	43.5	13.1	17.1	8.2	8.5	275	369
T22	1st May	67	70	101	102	46.7	45.4	13.4	14.4	8.6	8.4	275	375
T23	15th May	69	71	102	101	47.7	55.6	12.2	19.2	8.9	8.8	259	357
T24	1st June	71	72	105	103	49.7	63.7	12.3	20.3	8.2	8.9	318	421
SE(m)						2.0	1.6	1.5	0.7	0.2	0.2	20	29
CD (P=0.005)						5.9	5.0	4.2	2.1	0.6	0.6	57	86

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