



Effect of Planting Times on Growth and Phenological Attributes of Different Strawberry Cultivars

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ABSTRACT

Background: The current study was done to assess the effects of planting time on different cultivars of strawberry.

Methods: The experiment was conducted in open field conditions during the *rabi*. The treatment consisted of two factors; four planting times (October 2nd week P₁, October 4th week P₂, November 2nd week P₃ and November 4th week P₄) and three cultivars (Winter Dawn V₁, Camarosa V₂ and Nabila V₃), forming 12 treatment combinations arranged in a split plot design with three replications.

Result: The experimental results revealed that among the planting times, treatment P₄ (November 4th week) recorded highest survival percentage (84.91%), plant height (13.20 cm at 60 DAP and 15.82 cm at last harvest), number of leaves (11.77 and 14.90) and chlorophyll a, chlorophyll b and total content (1.26, 0.44 and 1.68 mg g⁻¹). It also showed the earliest flowering (29.41 days), fruit set (37.67 days) and first picking (48.73 days). In contrast, P₁ (October second week) showed the longest harvest duration (78.25 days) and maximum days to last picking (138.35 days). Among cultivars, Camarosa (V₂) recorded higher survival (83.85%), plant height (13.49 and 15.89 cm), leaf number (11.82 and 14.98) and total chlorophyll (1.65 mg g⁻¹). Winter Dawn (V₁) was earlier in flowering (28.95 days), fruit set (37.21 days) and first picking (49.02 days), while Camarosa had a longer fruiting period (78.54 days) and later last picking (137.01 days).

Key words: Chlorophyll, Cultivars, Pickings, Planting times.

INTRODUCTION

Strawberry (*Fragaria × ananassa* Duch.) belongs to the family Rosaceae. Genetically, it is an octaploid in nature, having the basic chromosome number $2n = 8 \times = 56$ (Sargent *et al.*, 2009). It is one of the most cherished and commercially valuable fruit crops worldwide, known for its vibrant red colour, distinctive aroma, delicious taste and excellent nutritional profile (Prasad *et al.*, 2022). Nutritionally, strawberries are considered as powerhouse of essential nutrients. They are low in calories free of cholesterol and have higher level of minerals like phosphorus, potassium, calcium and iron (Kumar *et al.*, 2011; Thokchom and Hazarika, 2024). The fruit contains flavonoids, particularly fisetin, which plays an important role in enhancing anticancer and antioxidant activity (Muttulani and Turnos, 2025). In India, although strawberry production is still limited, it is growing rapidly due to the adoption of improved varieties, protected cultivation methods and increased awareness among farmers. As of 2025, the total area under strawberry cultivation in India is approximately 3.27 thousand hectares, with a production of 22.45 thousand metric tonnes (Anonymous, 2025b). The major strawberry producing states include Maharashtra, Jharkhand, Haryana, Mizoram, Madhya Pradesh and Meghalaya. In the northern plain regions, strawberries are transplanted before the onset of winter and keep on harvesting until early summer. Its wider adaptability and short cropping period have made it suitable for integration into high-value horticultural systems. Strawberry is classified as a short-day or day-neutral plant, depending on the cultivar and its flowering is significantly influenced

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by photoperiod and temperature (Massa *et al.*, 2015 and Samad *et al.*, 2021). It is a temperate fruit with a short production cycle but with the introduction of day neutral cultivars, it can be successfully grown in subtropical and even tropical conditions using proper agronomic management (Moreira *et al.*, 2022 and Gogoi *et al.*, 2023). Climatically, strawberry thrives best in regions with moderate daytime temperatures (15°C to 25°C) and cool nights. The crop requires a well-distributed temperature regime during vegetative and reproductive stages. Excessive heat, frost or erratic temperature fluctuations can reduce flower and fruit quality. The flowering and fruiting behaviour of strawberry is strongly affected by

environmental conditions, especially temperature and day length (Massa *et al.*, 2015; Khammayom *et al.*, 2022 and Rivero *et al.*, 2022). Strawberry is an emerging crop in Gujarat, currently cultivated over an area of 37 hectares with a production output of 244 metric tonnes, (Anonymous, 2025a). While it remains relatively unfamiliar in north Gujarat, its popularity is gradually increasing among farmers in various parts of state. However, the crop's adaptability for large-scale commercial cultivation is progressing at a slow pace. Strawberry cultivation is gaining popularity in parts of South Gujarat (Rathod *et al.*, 2021) and the *Kutchh* region, North Gujarat remains underexplored for this crop, primarily due to its arid to semi-arid climate, higher temperatures and limited water availability. There exists a wide range of varietal diversity in strawberry, with differing in their growth habits, day length sensitivity, yield potential, fruit size, colour, taste, firmness, shelf life and resistance to pests and diseases. A study on the suitability of strawberry cultivars in Gujarat, particularly for North Gujarat is essential due to the region's diverse agro-climatic conditions. Choice of cultivars is of paramount importance for successful strawberry cultivation (Ahsan *et al.*, 2014). The timing of planting plays a significant role in flowering synchronization and overall yield. Early or delayed planting can disrupt the photo thermal response, affecting vegetative growth, flowering and fruiting. The planting time and cultivar selection play a critical role in strawberry production, considering these the present investigation was planned to investigate in the North Gujarat condition.

MATERIALS AND METHODS

The experiment was carried out in open field condition during *rabi* season of year 2023-24 and 2024-25 at College Farm, College of Horticulture, S.D. Agricultural University, Jagudan, Mehsana, Gujarat. The experiment comprised of two factors *viz.*, Planting time with four levels *viz.*, October 2nd week (P_1), October 4th week (P_2), November 2nd week (P_3) and November 4th week (P_4) and three cultivars *viz.*, Winter dawn (V_1), Camarosa (V_2) and Nabila (V_3). Thus, total 12 treatment combinations were tested under split plot design with 3 replications. The planting was done in 60 cm wide and 30 cm raised paired bed covered with 30 μ m silver-black mulch at the spacing of 60 cm $\times$ 30 cm $\times$ 30 cm. Each plot was uniformly covered with the 20 GSM non-woven crop cover after 15 days of planting. The data were recorded on various growth characters *viz.*, survival per cent after 15 days of planting, plant height, number of leaves and chlorophylla, chlorophyllb and total content at last harvest was recorded. However, Phenological parameters, *viz.*, days to flower initiation, days to fruit setting, days to first picking, days to last picking and fruiting duration were recorded. The data generated during the course of study on various aspects were tabulated and analyzed through standard statistical methods given by (Panse and Sukhatme, 1967). The significance of difference was tested by "F" test with a critical difference (CD) at $P=0.05$.

RESULTS AND DISCUSSION

Per cent survival of plants

The result presented in Table 1 revealed that among the planting time, November 4th week (P_4) recorded the numerically maximum survival (84.91 per cent). In case of cultivars, there was no significant variation in survival per cent of plants. However, numerically highest survival per cent (83.85) was recorded in cultivar Camarosa (V_2) followed by Nabila (V_3) 82.96 per cent and Winter Dawn (V_1) 81.77 per cent, respectively. The interaction effect of planting time and cultivars was found statistically non-significant for survival per cent of strawberry plants. However, numerically maximum survival (86.75 per cent) was recorded in the treatment P_4V_1 . The results indicated that later planting might be more advantageous for strawberry establishment. Early planting showed low survival that could be due to the environmental conditions especially the temperature plays a crucial role in influencing strawberry plant survival (Bisht *et al.*, 2024). However, planting in October or November allows cooler temperatures that favour root establishment (Paul *et al.*, 2017).

Plant heights (cm) at 60 DAP and at last harvest

The data on plant height indicated that planting time, P_4 (November 4th week) was recorded the maximum plant height (13.20 cm) at 60 DAP and (15.82 cm) at last harvest. Further, the lowest plant height (11.16 and 13.72 cm at 60 DAP and last harvest, respectively) was observed in the treatment (P_1) planting in October 2nd week. Among the cultivars, Camarosa (V_2) recorded significantly highest plant height (13.49 cm) at 60 DAP and (15.89 cm) at last harvest, followed by cultivar Nabila (V_3). Cultivars, Winter Dawn (V_1) registered lowest plant height (11.37 and 13.75 cm at 60 DAP and last harvest, respectively). Further, interaction of planting time and cultivars was found non-significant for plant height at 60 DAP and at harvest. Moreover, Camarosa planted on November 4th week (P_4V_2) recorded numerically highest plant height (14.34 and 17.12 cm at 60 DAP and last harvest, respectively). During the experimentation October experience higher average temperatures than November, this might stress the plants and slow down their growth initially. As temperature decreases in November, the plants might get conducive environment for vegetative growth irrespective of cultivars tested. Availability of low temperature, high relative humidity and low light intensity during mid October and mid November might favoured good growth in the plants of strawberry (Sadiq and Kaur, 2017). Cultivar Camarosa (V_2) showed taller plant height among other cultivars with respect to all the planting time. Ahmad *et al.* (2018) also found maximum plant height in cultivar Camarosa at Meghalaya condition. However, Singh (2016) reported maximum plant height in Camarosa under sub-tropical condition of Punjab. Different strawberry varieties have varying photoperiod and temperature requirements for optimal growth.

Number of leaves per plant at 60 DAP and last harvest

The perusal of data presented in Table 1 on number of leaves at 60 days after planting and at last harvest showed that among planting time, November 4th week (P₄) recorded maximum number of leaves (11.77) at 60 DAP and (14.90) at last harvest. However, treatment P₃ (November 2nd week) was at par with (P₄). Further, the lowest number of leaves (9.93 at 60 DAP and 12.76 at last harvest) was observed in the treatment (P₁) October 2nd week. Among the different cultivars, Camarosa (V₂) recorded highest number of leaves (11.82) at 60 DAP and (14.98) at last harvest. Moreover, cultivars, Winter Dawn (V₁) recorded the lowest number of leaves (10.15 and 13.20, respectively) at 60 DAP and at last harvest. The interaction effect of planting time and cultivars on number of leaves at 60 days after planting and at last harvest was found statistically non-significant. Although, the treatment P₄V₂ recorded numerically

maximum number of leaves (12.63 and 15.83, respectively) at 60 DAP and at last harvest. Planting done during the second and fourth week of November showed better leaf retention, this might be due to the congenial weather especially low temperature during the day and relatively cooler nights. The present investigation indicated that the cultivars, Camarosa (V₂) showed maximum number of leaves at 60 DAP and also at last harvest compared to the other cultivars with respect to all the planting time. The results are in line with the findings of (Beniwal *et al.*, 1989; Kher 2010; Rahman *et al.*, 2014; Jatav, 2019; Panigrahi *et al.*, 2020; Verma, 2022 and Jat, 2023) in strawberry crop.

Chlorophyll a, Chlorophyll b and total content (mg/g) at last harvest

An appraisal of data tabulated in Table 2 indicated that the planting time treatment P₁ (October 2nd week) recorded

Table 1: Effect of planting time and cultivars on survival per cent, plant height and number of leaves of strawberry.

Treatments	Survival per cent	Plant height (cm) at 60 DAP	Plant height (cm) at last harvest	Number of leaves per plant at 60 DAP	Number of leaves per plant at last harvest
Planting time (P)					
P ₁ : October 2 nd week	79.53	11.16	13.72	9.93	12.76
P ₂ : October 4 th week	82.97	12.39	14.76	11.03	13.92
P ₃ : November 2 nd week	84.03	13.08	15.24	11.54	14.51
P ₄ : November 4 th week	84.91	13.20	15.82	11.77	14.90
S.Em.±	1.27	0.27	0.41	0.26	0.41
C.D.(P=0.05)	NS	0.83	1.28	0.80	1.25
CV %	6.48	9.19	11.82	9.93	12.32
Cultivar (V)					
V ₁ : Winter dawn	81.77	11.37	13.75	10.15	13.20
V ₂ : Camarosa	83.85	13.49	15.89	11.82	14.98
V ₃ : Nabila	82.96	12.52	15.02	11.23	13.88
S.Em.±	0.87	0.15	0.22	0.19	0.22
C.D. (P=0.05)	NS	0.43	0.65	0.54	0.64
Interaction					
P ₁ V ₁	80.00	9.92	12.11	9.12	12.21
P ₁ V ₂	79.33	12.37	14.98	10.70	13.71
P ₁ V ₃	82.67	11.20	14.09	9.98	12.37
P ₂ V ₁	83.50	12.03	14.29	10.40	13.10
P ₂ V ₂	82.75	13.25	15.79	11.70	14.84
P ₂ V ₃	83.00	11.89	14.19	10.98	13.82
P ₃ V ₁	85.17	11.82	14.54	10.54	13.81
P ₃ V ₂	83.93	14.00	15.68	12.25	15.56
P ₃ V ₃	82.14	13.41	15.51	11.83	14.16
P ₄ V ₁	86.75	11.69	14.05	10.53	13.71
P ₄ V ₂	85.83	14.34	17.12	12.63	15.83
P ₄ V ₃	80.00	13.57	16.28	12.14	15.16
Interaction effect					
P×V					
S.Em.±	1.74	0.30	0.45	0.37	0.44
C.D. (P=0.05)	NS	NS	NS	NS	NS
CV%	5.14	5.83	7.39	8.29	7.77

higher chlorophyll a, chlorophyll b and total contents (1.26, 0.44 and 1.68 mg/g, respectively). Among cultivars, significantly higher content of leaves chlorophyll a, chlorophyll b and total was recorded in Camarosa (V_2) (1.23, 0.45 and 1.65 mg/g, respectively).

The interaction effect revealed that Camarosa planted during second week of October (P_1V_2) recorded the highest chlorophyll a, chlorophyll b and total (1.30, 0.46 and 1.72 mg/g, respectively). The interaction effect of planting time and cultivar for leaves chlorophyll content at last harvest was found statistically significant. Leaf chlorophyll content of strawberry was significantly influenced by planting time. Planting in 2nd and 4th week of October was found better for chlorophyll content. Singh *et al.* (2012) also found higher chlorophyll content under 50% shade net condition in strawberry in cultivar 'Ofra' planted in the month of October and November. Cultivar Camarosa shows higher chlorophylla, chlorophyllb and total content at last harvest observations with respect to all the planting time.

Costa *et al.* (2012) also reported the higher chlorophyll a, b and total in cultivar Camarosa than Oso Grande under protected environment. The reason for increased chlorophyll contents might be due to increased photosynthetic activity in leaves of early planting, Mushtaq (2023).

Days taken to flower initiation and fruit setting

The mean data provided in Table 3 on days to flower initiation and fruit setting of strawberry indicated that planting time, P_4 (November 4th week) initiated significantly earliest flowering and fruit setting (29.41 and 37.67 days, respectively). Moreover, treatment (P_3) November 2nd week planting was found statistically at par with P_4 (November 4th week). In contrast treatment P_1 (October 2nd week) took maximum number of days (34.00 days) to flower initiation, however, treatment P_2 (October 4th week) recorded the maximum (43.06) days to fruit setting after planting.

Among the cultivar, winter dawn (V_1) initiated flowering and fruit setting earliest (28.95 and 37.21 days, respectively),

Table 2: Effect of planting time and cultivars on chlorophyll content at last harvest of Strawberry.

Treatments	Chlorophyll a (mg/g)	Chlorophyll b (mg/g)	Total chlorophyll (mg/g)
Planting time (P)			
P_1 : October 2 nd week	1.26	0.44	1.68
P_2 : October 4 th week	1.22	0.46	1.65
P_3 : November 2 nd week	1.16	0.41	1.55
P_4 : November 4 th week	1.13	0.38	1.49
S.E.m.±	0.01	0.005	0.01
C.D.(P=0.05)	0.04	0.01	0.04
CV %	4.58	4.85	3.82
Cultivar (V)			
V_1 : Winter dawn	1.17	0.40	1.55
V_2 : Camarosa	1.23	0.45	1.65
V_3 : Nabila	1.19	0.42	1.58
S.E.m.±	0.01	0.003	0.009
C.D.(P=0.05)	0.02	0.01	0.03
Interaction			
P_1V_1	1.26	0.43	1.69
P_1V_2	1.30	0.46	1.72
P_1V_3	1.22	0.41	1.64
P_2V_1	1.16	0.42	1.55
P_2V_2	1.29	0.50	1.71
P_2V_3	1.22	0.47	1.68
P_3V_1	1.16	0.40	1.53
P_3V_2	1.20	0.42	1.60
P_3V_3	1.13	0.41	1.52
P_4V_1	1.06	0.35	1.39
P_4V_2	1.15	0.41	1.59
P_4V_3	1.17	0.39	1.51
Interaction effect			
$P \times V$			
S.E.m.±	0.01	0.01	0.02
C.D.(P=0.05)	0.04	0.02	0.05
CV %	2.60	3.73	2.70

whereas, cultivar (V_3) Nabila in 29.75 and 38.42 days, respectively, which was statistically at par with treatment (V_1). However, Cultivar (V_2) Camarosa exhibited the longest duration (36.28 and 46.29 days, respectively) to flower initiation and fruit setting.

The interaction effect showed that P_3V_1 recorded the minimum number of days to flower initiation and fruit setting (27.44 and 36.00 days, respectively). Moreover, Treatment P_4V_1 (28.28 and 36.17 days, respectively) and P_4V_3 (29.13 and 35.83 days, respectively) were found statistically at par with the treatment (P_3V_1). In contrast, the treatment combination P_1V_2 significantly delayed the flower initiation and fruits setting (39.90 and 49.67 days, respectively).

The variation observed in days to flower initiation and fruit setting with the planting times particularly P_4 (November 4th week) combined with early-flowering cultivars such as (V_1) Winter Dawn and (V_3) Nabila, favoured quicker transition to reproductive growth, while early planting with late-

flowering variety V_2 prolonged the vegetative phase and delayed flowering. This might be due to the congenial environmental conditions during the reproductive phase and the genetic characteristic of the cultivars. Strawberry flowering and fruit set are strongly influenced by temperature, photoperiod and plant developmental stage. Flowering induced by short photoperiod, which also reduces vegetative growth (Konsin *et al.*, 2001). The critical duration of the day depends heavily on temperature (Rozbiany *et al.*, 2023). However, flowering is prevented at high temperatures above 24°C, short days promote flowering and fruiting at moderate temperatures between 14 and 20°C Verheul *et al.* (2006). When strawberry was planted in October, the plants might exposed to warmer temperature during their early growth and reproductive initiation phase. The later planting November 4th week and November 2nd week showed better response in early flower initiation days after planting in strawberry. Paul *et al.* (2017)

Table 3: Effect of planting time and cultivars phenological attributes of strawberry.

Treatments	Days to flower initiation	Days to fruit setting	Days to first picking	Days to last picking	Fruiting duration (days)
Planting time (P)					
P_1 : October 2 nd week	34.00	42.11	56.81	138.35	78.25
P_2 : October 4 th week	32.65	43.06	53.14	129.35	76.10
P_3 : November 2 nd week	30.58	39.72	51.82	124.76	71.47
P_4 : November 4 th week	29.41	37.67	48.73	119.64	68.56
S.Em.±	0.59	0.55	0.95	2.59	1.31
C.D. (P=0.05)	1.81	1.70	2.92	7.97	4.04
CV %	7.87	5.76	7.65	8.58	7.56
Cultivar (V)					
V_1 : Winter dawn	28.95	37.21	49.02	120.58	70.17
V_2 : Camarosa	36.28	46.29	57.45	137.01	78.54
V_3 : Nabila	29.75	38.42	51.40	126.49	72.08
S.Em.±	0.26	0.35	0.47	1.19	0.64
C.D. (P=0.05)	0.76	1.00	1.36	3.43	1.83
Interaction					
P_1V_1	30.80	38.00	52.66	129.68	73.64
P_1V_2	39.90	49.67	61.92	147.56	84.40
P_1V_3	31.31	38.67	55.85	137.83	76.72
P_2V_1	29.29	38.68	48.64	120.85	72.35
P_2V_2	39.38	49.00	59.37	140.58	83.55
P_2V_3	29.29	41.50	51.41	126.63	72.41
P_3V_1	27.44	36.00	47.56	116.01	67.59
P_3V_2	35.01	45.50	58.10	135.95	76.26
P_3V_3	29.29	37.67	49.80	122.32	70.56
P_4V_1	28.28	36.17	47.24	115.79	67.09
P_4V_2	30.81	41.00	50.43	123.95	69.93
P_4V_3	29.13	35.83	48.51	119.18	68.65
Interaction effect					
$P \times V$					
S.Em.±	0.53	0.70	0.95	2.38	1.27
C.D. (P=0.05)	1.52	2.00	2.72	NS	3.67
CV %	4.07	4.19	4.40	4.56	4.24

also found the early flowering in November planted strawberry in Bangladesh. However, Bhamini *et al.* (2017) obtained earlier flowering and fruiting in Winter Dawn when planted between 15 October and 1st November in Bihar. Further they were also observed that the 5th October planting exhibited maximum growth and took longest duration to initiate flowering and fruit set. Favourable day temperature could lead to advanced both flowering and fruiting (Singh *et al.*, 2005). In this region, strawberries planted in the second week of October are subjected to higher temperatures during the onset of their reproductive phase, which can lead to delayed flowering due to suboptimal conditions for floral induction. Conversely, as per the current finding strawberry planted in the second to fourth week of November experiences cooler temperature perhaps promoted both vegetative growth and more synchronized early floral initiation. Initiation of early flowering in cv. Winter Dawn at Rahuri conditions was reported by Kasture (2024). However, Rahman *et al.* (2014) found maximum days for flowering in Camarosa (24.83).

Days taken to first picking

The data presented in Table 3 indicated that, among planting time, earliest first picking (48.73 days) was recorded in the treatment P₄ (November 4th week), whereas, treatment P₃ (November 2nd week) with 51.82 days was found statistically at par with the treatment P₄. In contrast, treatment P₁ (October 2nd week), took maximum days to first picking (56.81 days). In case of Cultivar, Winter Dawn (V₁) initiated earliest fruit picking (49.02 days), followed by Cultivar (V₃) Nabila (51.40 days). However, Cultivar (V₂) Camarosa took the longest duration (57.45 days) for first picking after planting. The interaction of planting time and cultivar for days to first picking was found statistically significant. Treatment combination P₄V₁ recorded the earliest first fruit picking (47.24 days) followed by treatment P₃V₁ (47.56 days) and P₂V₁ (48.64 days). In contrast, the treatment combination P₁V₂ significantly exhibited the maximum days (61.92 days) to first fruit picking. The results indicated that later planting, either November 4th week or November 2nd week in combination with Winter Dawn or Nabila, exhibited early days to first fruit picking. While, the (V₂) Camarosa days to first fruit was delayed with respect to different planting time. This could be due to the genetic inheritance of the varieties which interact with environment and shows distinct phenological behaviours.

Days taken to last picking

The data presented in Table 3 showed that the days to last picking was significantly influenced by planting time. Maximum duration to last picking was observed in the treatment P₁ (October 2nd week), which was 138.35 days. In contrast, the lowest duration (119.64 days) of last picking was recorded in the treatment P₄ (November 4th week).

Among Cultivar, (V₂) Camarosa significantly took the longest duration (137.01 days) for last picking of fruit after planting, followed by cultivar (V₃) Nabila (126.49 days).

Conversely, the lowest days (120.58) to last picking was recorded in the cultivar (V₁) Winter Dawn. The interaction of planting time and cultivar for days to last picking was found statistically non-significant. Moreover, the interaction effect revealed that the treatment combination P₁V₂ exhibited the numerically maximum days to last picking (147.56) followed by the treatment P₂V₂ with 140.58 days.

The results indicated that early planting either P₁ (October 2nd week) or P₂ (October 4th week) took longer duration for last picking in combination with (V₂) Camarosa and (V₃) Nabila. However, in later planting, November 4th week and November 2nd week in combination with Winter Dawn or Nabila, fruiting lost early, thus the duration of days to last picking was observed lowest. In many cultivars, cooler temperatures in early winter after planting trigger flowering (Sonsteby and Heide 2009). While, in October planting, warmer conditions and longer day lengths forced plants for constant vegetative growth but in relatively slower rate and flowering is thus delayed, but the plant flowered and fruited longer. The later planting during second and fourth week of November was also flowered and fruited earlier compared to the October planting that might be due to the availability of congenial weather condition particularly cooler temperature during the reproductive phase of November planting strawberry. As per the study of Ledesma *et al.* (2008) a high day/night temperature significantly reduced the number of inflorescences, flowers and fruits.

Fruiting duration (days)

A perusal of data presented in Table 3 showed that the maximum fruiting duration was recorded in (P₁) October 2nd week (78.25 days). Shortest fruiting duration (68.56 days) was observed in (P₄) November 4th week. Regarding cultivars, (V₂) Camarosa, recorded longest fruiting duration (78.54 days) followed by (V₃) Nabila (72.08 days) whereas, shortest fruiting duration (70.17 days) was observed in (V₁) winter Dawn. The Interaction effects indicated that P₁V₂ had maximum fruiting duration (84.40 days) followed by the treatment P₂V₂ (83.55 days). However, minimum fruiting duration (67.09 days) was recorded in P₄V₁.

The results show that planting of strawberry in October 2nd week and October 4th week enhanced the fruiting duration in combination with (V₂) Camarosa and (V₃) Nabila, however, planting in November 4th week and November 2nd week, reduced the fruiting durations. It might be due to the higher temperature during peak fruiting reduced new flushes in particular treatment which resulted in no fruit after harvesting. The results are associated with Singh (2016) and Neetu and Sharma (2018) in strawberry.

CONCLUSION

The result of the experiment demonstrated that among the planting times, November 4th week was found optimal for highest plant survival, plant height, number of leaves, chlorophyll contents, earliest flowering, fruit setting and

first picking. However, October 2nd week planting exhibited maximum picking and longest fruiting duration. Among the cultivars tested, Camarosa performed better in growth attributes and exhibited longest days to last picking and fruiting duration. However, Winter Dawn initiated early flowering and fruiting.

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Conflict of interest

All authors declared that there is no conflict of interest.

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