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Effect of foliar spray of calcium and micro-nutrients on growth parameters, flowering, fruiting and fruit maturity of strawberry (*Fragaria x ananassa* Duch.) cv. Nabila under net tunnel.

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Abstract

The experiment was conducted at Research Farm of Centre of Excellence on Protected Cultivation and Precision Farming under net tunnel, College of Agriculture, IGKV, Raipur (C.G.) to find out the effect of Calcium and micro-nutrients on growth parameters, flowering, fruiting and fruit maturity of strawberry cultivar Nabila under net tunnel condition. The experiment was conducted with ten treatments and three replications in Randomized Completely Block Design. The treatment consisted ten different concentrations of Calcium and micro-nutrients along with recommended dose of fertilizers viz. T₀: RDF + control (water spray), T₁: RDF + CaCl₂ @ 0.4%, T₂: RDF + CaCl₂ @ 0.6%, T₃: RDF + CaCl₂ @ 0.8%, T₄: RDF + ZnSO₄ @ 0.4%, T₅: RDF + ZnSO₄ @ 0.6%, T₆: RDF + ZnSO₄ @ 0.8%, T₇: RDF + FeSO₄ @ 0.4%, T₈: RDF + FeSO₄ @ 0.6% and T₉: RDF + FeSO₄ @ 0.8%. As per the growth parameters are concerned the treatment T₈ (RDF + FeSO₄ @ 0.6%) showed maximum vegetative growth i.e. Plant height, number of leaves, plant spread and number of runners per plant, while the minimum was recorded under the treatment T₀ (RDF + water spray). Earliest flowering, fruiting and fruit maturity was exhibited under the treatment T₈ (RDF + FeSO₄ @ 0.6%), whereas the treatment T₀ (RDF + water spray) had too late in flowering, fruiting and maturity of the fruits.

Keywords: Calcium, micro-nutrients, growth parameters, strawberry etc.

Introduction

The cultivated strawberry (*Fragaria × ananassa* Duch.) is octaploid in nature. In the 17th century it has been derived from North American species, *Fragaria chiloensis* and *Fragaria virginiana* in France. It belongs to the family Rosaceae. Botanically, strawberry fruit is termed as aggregate fruit called *etario of achenes* and the edible part is succulent thalamus. It is mainly propagated through runners which is one year old. Its fruits are mainly consumed as dessert. In our country the total area of strawberry is 1000 ha with production of 5000 MT (Anonymous, 2016) [1]. In India, Maharashtra is the leading State in production of strawberry fruits. It is also commercially grown in Haryana, Punjab, Uttar Pradesh, Jammu and Kashmir, Uttarakhand and lower hills of Himachal Pradesh.

It has been widely adopted as the small fruits having 98% edible portion. It is good source of vitamin C and Iron. Fruit shape differs depending upon the variety. It may be conical, round and long to conical, conical with constricted base and cylindrical ground. The strawberry fruit contains 89-90 % moisture, 0.7-9.2g protein, 8.4-9.2g carbohydrate, 0.5g fat, 59-120 mg vitamins C per 100g of fresh weight of fruit. The strawberry fruit contains 0.90 to 1.85% acidity the prominent being mallic and citric acid and 0.55% total sugar.

The nutrition status of strawberry plant plays a vital role in determining the growth of plant since it is a very sensitive plant to nutritional balance (Mohamed *et al.*, 2011) [9]. An optimal fertilization is contributive in obtaining high yield of good quality and high biological value.

Among various micro-nutrients, iron (Fe) and zinc (Zn) plays an important role in promoting vegetative growth of strawberry plants (Chaturvedi *et al.*, 2005) [4]. Iron (Fe) is one of the essential elements required by the plants owing to its vital and essential role on plant growth and development.

It is also a constituent of enzyme systems and so it plays an important role in plant enzyme reactions (Das, 2006) [5]. Mahnaz *et al.*, 2010 claimed that ZnSO₄ as a source of zinc had a Positive effect in increasing leaf area, length and diameter of petiole, fresh and dry shoot ratio of strawberry plant.

Methods and materials

The field experiment was carried out during the year 2017-18 at Research Farm of Centre of Excellence on Protected Cultivation and Precision farming under net tunnel, College of Agriculture, IGKV, Raipur (C.G.). The soil of experimental field was clay-loam having PH 7.7. The experiment was conducted on strawberry crop cv. Nabila planted in field at 30cm x 30cm distance with foliar feeding of Ca and micro-nutrients in 3 different concentrations along with fertigation of recommended dose of fertilizers applied at 30th and 60th days after planting and maintained uniform cultural practices under net tunnel condition.

The experiment was laid out in Randomized Completely Block Design (RCBD) with three replications and ten treatments. The treatment consisted ten different concentrations of Ca and micro-nutrients along with recommended dose of fertilizers *viz.* T₀: RDF + Control (water spray), T₁: RDF + CaCl₂ @ 0.4%, T₂: RDF + CaCl₂ @ 0.6%, T₃: RDF + CaCl₂ @ 0.8%, T₄: RDF + ZnSO₄ @ 0.4%, T₅: RDF + ZnSO₄ @ 0.6%, T₆: RDF + ZnSO₄ @ 0.8%, T₇: RDF + FeSO₄ @ 0.4%, T₈: RDF + FeSO₄ @ 0.6% and T₉: RDF + FeSO₄ @ 0.8%.

All the experimental plants were uniformly maintained and same cultured practices were provided *i.e.* fertilization, irrigation and plant protection measures during whole period of investigation. Irrigation and fertilizers has been provided to the plants through the drip system of irrigation.

The solutions of different concentrations were spread carefully to wet both the surfaces of the whole plant. Care was taken to have a uniform spray of the plant. The solution, which fell from the leaves, was collected on polythene sheets, which were spread on the ground. The precaution was taken to avoid the addition of nutrients to the soil. Spraying of micro-nutrients was done with the help of knap sack sprayer and to avoid contamination sprayer was washed thoroughly before spraying.

Under growth parameters, the observations *i.e.* plant height (cm), leaves per plant, plant spread (cm) (N-S & E-W directions), runners per plant, days to first flowering, days to first fruiting and days to maturity were recorded.

Results and discussion

The results of experiment pertaining to various aspects of growth parameters, flowering, fruiting and fruit maturity is summarized as follows:

Plant Height (cm)

Effect of foliar application of Ca and micro-nutrients showed significant differences in respect to plant height observed at 30, 60, 90 and 120 days after planting.

At 30 DAP, no significant differences were observed among the treatments in respect to plant height. The maximum plant height (9.23 cm) was recorded under the treatment T₈ (RDF + FeSO₄ @ 0.6%) and the minimum plant height (8.17 cm) was observed under the treatment T₀ (RDF + Control).

At 60 DAP, the maximum plant height (19.33 cm) was recorded under the treatment T₈ (RDF + FeSO₄ @ 0.6%), which was found at par with T₅ having plant heights of 17.63 cm. Similarly treatments T₅ & T₂ and T₄, T₇, T₆, T₁ & T₃ having respective plant heights of 17.63 & 15.73 and 16.37, 16.27, 15.83, 15.67 & 14.53 cm showed non-significant differences with each other. The minimum plant height (13.17 cm) was observed under the treatment T₀ (RDF+ Water), which was recorded non-significant differences with treatments T₉ and T₃ having respective plant heights of 14.37 and 14.53 cm.

At 90 DAP, the maximum plant height (23.87 cm) was recorded under the treatment T₈ (RDF + FeSO₄ @ 0.6%). The treatment T₅ & T₂ and T₇, T₄, T₆ & T₁ having respective plant heights of 21.43 & 20.60 cm and 20.47, 20.13, 19.93 & 19.70 cm showed non-significant differences with each other in respect to plant height at 90 days after transplanting. However the minimum plant height (17.27 cm) was confirmed under the treatment RDF + Control (T₀), which was recorded non-significant differences with treatments T₉ and T₃ having respective plant heights of 18.40 and 17.97 cm.

At 120 DAP, the superiority of treatment T₈ (RDF + FeSO₄ @ 0.6%), registered maximum plant height (31.57 cm). Treatments T₅, T₂ & T₇ and T₂, T₇, T₄, T₁ & T₆ with respective plant heights of 29.47, 28.97 & 28.80 and 28.97, 28.80, 28.20, 27.77, 27.33 cm showed non-significant differences with each other. However the minimum plant height (25.33 cm) was recorded under the treatment RDF + Control (T₀), which was recorded non-significant differences with treatments T₃, T₉ and T₆ having plant heights of 26.03, 26.47 and 27.33 cm respectively.

Among the different treatments of Ca and micro-nutrients, the maximum plant height was observed under T₈ (RDF + FeSO₄ @ 0.6%), while the minimum plant height was recorded under RDF + Control (T₀). These results were in close agreement with the findings of Chaturvedi *et al.* (2005) [4], Bakshi *et al.* (2013a) [2], Bakshi *et al.* (2013b) [3] and Singh *et al.* (2015) [4] in strawberry.

Plant Spread (cm) E-W direction

The data recorded on plant spread at 30, 60, 90 and 120 DAP influenced significantly with the foliar application of Ca and micro-nutrients.

As per data observed on E-W direction at 30 DAP, no significant differences were observed in respect to plant spread. The treatment T₈ (RDF + FeSO₄ @ 0.6%) obtained maximum plant spread (10.63 cm) and the minimum plant spread (9.70 cm) was noticed under the treatment T₉.

At 60 DAP on E-W direction the treatment T₈ (RDF + FeSO₄ @ 0.6%), confirmed the maximum plant spread (25.00 cm), followed by T₅ with plant spread (23.33 cm). Moreover the treatments T₂, T₄, & T₇ and T₁, T₄ & T₇ and T₆, T₃ & T₉ and T₆ & T₉ also showed non-significant differences with each other in respect to plant spread at 60 DAP on N-S direction. The treatments T₁, T₂, T₃ and T₅ found significant difference with each other. However the minimum plant spread (13.80 cm) was recorded under the treatment RDF + Control (T₀).

At 90 DAP on E-W direction the maximum plant spread (29.03 cm) was observed under the same treatment T₈ (RDF + FeSO₄ @ 0.6%), followed by T₅ having plant spread of (27.37 cm). Similarly the treatments T₂, T₄, & T₇ and T₄, T₇ & T₁ and T₃, T₉ & T₆ and T₉ & T₆ having respective average plant spreads of 25.57, 24.90 & 24.87 and 24.90, 24.87 & 23.80 and 24.87, 20.87 & 20.47 and 20.87 & 20.47 cm showed statistically non-significant with each other. However the minimum plant spread (17.83 cm) was recorded under the treatment T₀ (RDF + Control).

The data recorded at 120 DAP on E-W direction the superiority of treatment T₈ (RDF + FeSO₄ @ 0.6%), registered maximum plant spread (34.10 cm), followed by T₅ with plant spread (32.43 cm). Similarly the treatments T₂, T₄, & T₇ and T₄, T₇ & T₁ and T₃, T₉ & T₆ and T₉ & T₆ having respective average plant spread of 30.63, 29.97 & 29.93 and 29.97, 29.93 & 28.87 and 24.87, 25.93 & 25.53 and 25.93 & 25.53 cm showed statistically non-significant with each other. However the minimum plant spread (22.90 cm) was recorded under the treatment T₀ (RDF + Control).

Plant Spread (cm) N-S direction

At 30 DAP, no significant difference were observed among the treatments in respect to plant spread on N-S direction. The treatment T₈ (RDF + FeSO₄ @ 0.6%) obtained maximum plant spread (12.63 cm) and the minimum plant spread was noticed under the treatment T₃ having average plant spread of (11.47 cm). At 60 DAP, the treatment T₈ (RDF + FeSO₄ @ 0.6%) obtained maximum plant spread (25.67 cm) followed by T₅ with plant spread (24.00 cm) at N-S direction. The treatments T₂, T₄, & T₇ and T₁, T₄ & T₇ and T₆, T₃ & T₉ and T₆ & T₉ also recorded non-significant differences with each other. However the minimum plant spread (14.47 cm) was noticed under the treatment RDF + Control (T₀).

The data pertaining to plant spread (N-S) observed at 90 days after planting revealed that the maximum plant spread (29.70 cm) was recorded under T₈(RDF + FeSO₄ @ 0.6%) followed by T₅ with plant spread (28.03 cm) on N-S direction. Most of the treatments *i.e.* T₂, T₄, & T₇ and T₄, T₇ & T₁ and T₉, T₆ & T₃ and T₉ & T₆ having respective average plant spread of 26.23, 25.57 & 25.53 and 25.57, 25.53 & 24.47 and 21.53, 21.13 & 20.47 and 21.53 & 21.13 cm showed statistically non-significant with each other. The minimum plant spread (18.50 cm) was noted under RDF + Control (T₀).

Similarly at 120 DAP on N-S direction the treatment T₈ (RDF + FeSO₄ @ 0.6%) registered the maximum plant spread (34.77 cm), followed by T₅ with plant spread (32.43 cm) on E-W direction. Similarly the treatments T₂, T₄, & T₇ and T₄, T₇ & T₁ and T₉, T₆ & T₃ having respective plant spread of 31.30, 30.63 & 30.60 and 30.63, 30.60 & 29.30 and 26.60, 26.20 & 25.07 cm, also showed non-significant differences with each other. The minimum plant spread (23.57 cm) was recorded under the treatment RDF + Control (T₀). These results were in close agreement with the findings of Bakshi *et al.* (2013a) [2] Bakshi *et al.* (2013b) [3] and Singh *et al.* (2015) [4] in strawberry.

Leaves per plant

At 30 DAP, no significant differences were observed among the treatments in respect to number of leaves per plant. Maximum number of leaves per plant (7.63) was observed under the treatment T₈ (RDF + FeSO₄ @ 0.6%) and the minimum number of leaves per plant (6.70) was recorded under the treatment T₉.

The data pertaining to number of leaves per plant observed at 60 day after planting revealed that the maximum number of leaves per plant (20.40) was recorded under the superiority of T₈(RDF + FeSO₄ @ 0.6%), which was found statistically at par with T₅ having average number of leaves 20.40. Similarly the treatments T₅ & T₂ and T₅, T₂ & T₄ and T₅, T₂, T₄ & T₁ and T₂, T₄, T₁ & T₇ and T₂, T₄, T₁, T₇ & T₆ showed non-significant differences with each other at 5 % level of significance. However the minimum number of leaves per plant (15.30) was recorded under the treatment RDF + Control (T₀), which was found significant difference among all other treatments.

At 90 DAP, the superiority of treatment T₈ (RDF + FeSO₄ @ 0.6%), registered maximum number of leaves per plant (32.10), which showed non-significant differences with T₅ (RDF + ZnSO₄ @ 0.6%) having number of leaves per plant of 31.10. Similarly the treatments T₅ & T₂ and T₅, T₂ & T₄ and T₅, T₂, T₄ & T₁ and T₂, T₄, T₁ & T₇ and T₂, T₄, T₁, T₇ & T₆ showed non-significant differences with each other at 5 % level of significance. However the minimum number of leaves per plant (27.33) was recorded under the treatment RDF + Control (T₀), which was found significant difference among all other treatments.

Similarly at 120 DAP, the maximum number of leaves per plant (43.50) was observed under the same treatment T₈ (RDF + FeSO₄ @ 0.6%), which showed non-significant differences with T₅ (RDF + ZnSO₄ @ 0.6%) having number of leaves per plant of 42.33. Similarly the treatments T₅ & T₂ and T₅, T₂ & T₄ and T₅, T₂, T₄ & T₁ and T₂, T₄, T₁ & T₇ and T₂, T₄, T₁, T₇ & T₆ showed non-significant differences with each other at 5 % level of significance. The minimum number of leaves per plant (38.40) was registered under T₀ (RDF + Control), showed significant difference among all other treatments under the present experiment.

Among the different treatments of Ca and micro-nutrients the maximum number of leaves per plant was observed under the plants treated with T₈ (RDF + FeSO₄ @ 0.6%), while the minimum number of leaves per plant was recorded under T₀ (RDF + Control). Similar observations on number of leaves per plant due to FeSO₄ were also reported by Chaturvedi *et al.* (2005) [4], Bakshi *et al.* (2013a) [2], Bakshi *et al.* (2013b) [3] and Singh *et al.* (2015) [4] in strawberry.

Runners per plant

The maximum number of runners per plant (9.09) was noticed under the treatment T₈ (RDF + FeSO₄ @ 0.6%), which was found significant different with the treatments T₅ (RDF + ZnSO₄ @ 0.6%) having average number of runners per plant 6.80. Moreover the treatments T₁, T₂ & T₄ and T₁, T₂, T₄ & T₇ and T₁, T₂, T₃, T₄ & T₇ and T₃, T₇ & T₉ having respective number of runners 5.59, 5.70 & 5.66 and 5.59, 5.70, 5.66 & 5.33 and 5.59, 5.70, 5.30, 5.66 & 5.33 and 5.30, 5.33 & 4.99 were found non-significant different with each other under present investigation. The minimum number of runners per plant (4.34) was recorded under the treatment RDF + Control (T₀). Similar results were also obtained by Chaturvedi *et al.* (2005) [4] and Kazemi (2014) [6] in strawberry.

Days to first flowering

Days to first flowering was significantly influenced by different treatments of Ca and micro-nutrients. Amongst the different treatments minimum days to first flowering (40.17) was noticed under the treatment T₈ (RDF + FeSO₄ @ 0.6%), which was recorded significant difference with T₅ (RDF + ZnSO₄ @ 0.6%) having days to first flowering 41.57. The treatments T₁, T₂, T₆ & T₇ and T₁, T₂, T₇ & T₃ having respective days to first flowering 45.45, 44.35, 45.91 & 45.62 and 5.45, 44.35, 45.62 & 46.65 showed non-significant differences with each other under present investigation. Maximum days to first flowering (53.53) were observed under the treatment T₀ (control), which was statistically at par with T₉ (52.50). The present findings are in close agreement with the finding of Singh *et al.* (2015) [4], Mehraj *et al.* (2015) [8] in strawberry and Yadlod and Kadam (2003) [11] in banana.

Days to first fruiting

The minimum days to first fruiting (47.24) was noted under the treatment T₈ (RDF + FeSO₄ @ 0.6%), which was at par with T₅ (RDF + ZnSO₄ @ 0.6%) having days to first fruiting 48.63. Moreover the treatments T₁, T₂, T₅ & T₇ and T₁, T₂, T₇, T₆ & T₃ and T₁, T₃, T₄, T₇, T₆ & T₉ showed non-significant differences with each other under present investigation. The maximum days to first fruiting (60.61) was observed under the treatment T₀ (RDF + Control), which was at par with T₉ (59.50) days. These findings are close agreement with the findings of Yadlod and Kadam (2003) [11] in banana and Mehraj *et al.* (2015) [8] in strawberry.

Table 1: Effect of foliar feeding of Ca and micro-nutrients on plant height (cm) of strawberry cv. Nabila

Treatments	30 DAP	60 DAP	90 DAP	120 DAP
RDF + Water spray (Control)	8.17	13.17 ^a	17.27 ^a	25.33 ^a
RDF + CaCl ₂ @ 0.4%	9.60	15.67 ^{bcd}	19.70 ^{bcd}	28.77 ^{cde}
RDF + CaCl ₂ @ 0.6%	9.40	15.73 ^{defgh}	20.60 ^{defgh}	29.97 ^{defg}
RDF + CaCl ₂ @ 0.8%	8.87	14.53 ^{abc}	17.97 ^{ab}	27.03 ^{ab}
RDF + ZnSO ₄ @ 0.4%	9.07	16.37 ^{cdefg}	20.13 ^{cdef}	29.20 ^{cdef}
RDF + ZnSO ₄ @ 0.6%	9.30	17.63 ^{efghi}	21.43 ^{defgh}	30.47 ^{efg}
RDF + ZnSO ₄ @ 0.8%	9.17	15.83 ^{cde}	19.93 ^{cde}	28.33 ^{abcd}
RDF + FeSO ₄ @ 0.4%	9.03	16.27 ^{cdef}	20.47 ^{defg}	29.80 ^{defg}
RDF + FeSO ₄ @ 0.6%	9.23	19.33 ⁱ	23.87 ⁱ	31.57 ^h
RDF + FeSO ₄ @ 0.8%	8.80	14.37 ^{ab}	18.40 ^{abc}	26.47 ^{abc}
SE(m) ±	0.32	0.63	0.62	0.69
C.D. at 5%	N/A	1.87	1.86	2.09

1. DAP – Days after planting
2. RDF – Recommended dose of fertilizers
3. The superscript letter indicates that the treatment means with same letters are at par at 5% level of significance, while the means with different letters are significantly different at 5% level of significance. These letters have been affixed based on CD-value comparison of treatment means.

Table 2: Effect of foliar feeding of Ca and micro-nutrients on plant spread (cm) in E-W direction of strawberry cv. Nabila under net tunnel

Treatments	30 DAP	60 DAP	90 DAP	120 DAP
RDF + Water spray (Control)	10.27	13.80 ^a	17.83 ^a	22.90 ^a
RDF + CaCl ₂ @ 0.4%	10.00	19.77 ^d	23.80 ^d	28.87 ^d
RDF + CaCl ₂ @ 0.6%	9.93	21.53 ^e	25.57 ^{de}	30.63 ^{ef}
RDF + CaCl ₂ @ 0.8%	9.73	15.77 ^b	19.80 ^b	24.87 ^b
RDF + ZnSO ₄ @ 0.4%	10.07	20.87 ^{de}	24.90 ^{de}	29.97 ^{def}
RDF + ZnSO ₄ @ 0.6%	10.33	23.33 ^f	27.37 ^f	32.43 ^g
RDF + ZnSO ₄ @ 0.8%	10.10	16.80 ^{bc}	20.47 ^{bc}	25.53 ^{bc}
RDF + FeSO ₄ @ 0.4%	10.63	25.00 ^g	29.03 ^g	34.10 ^h
RDF + FeSO ₄ @ 0.6%	9.70	16.83 ^{bc}	20.87 ^{bc}	25.93 ^{bc}
RDF + FeSO ₄ @ 0.8%	9.83	20.83 ^{de}	24.87 ^{de}	29.93 ^{de}
SE(m) ±	N/A	1.50	1.63	1.59
C.D. at 5%	0.39	0.50	0.55	0.53

1. DAP – Days after planting
2. E-W – East-West
3. RDF – Recommended dose of fertilizers
4. The superscript letter indicates that the treatment means with same letters are at par at 5% level of significance, while the means with different letters are significantly different at 5% level of significance. These letters have been affixed based on CD-value comparison of treatment means.

Table 3: Effect of foliar feeding of Ca and micro-nutrients on plant spread (cm) in N-S direction of strawberry cv. Nabila under net tunnel

Treatments	30 DAP	60 DAP	90 DAP	120 DAP
RDF + Water spray (Control)	11.73	14.47 ^a	18.50 ^a	23.57 ^a
RDF + CaCl ₂ @ 0.4%	12.07	20.43 ^d	24.47 ^d	29.53 ^d
RDF + CaCl ₂ @ 0.6%	12.10	17.50 ^{bc}	21.53 ^{bc}	26.60 ^{bc}
RDF + CaCl ₂ @ 0.8%	11.47	16.43 ^b	20.47 ^b	25.53 ^b
RDF + ZnSO ₄ @ 0.4%	12.07	21.53 ^{de}	25.57 ^{de}	30.63 ^{def}
RDF + ZnSO ₄ @ 0.6%	12.33	24.00 ^f	28.03 ^f	33.10 ^g
RDF + ZnSO ₄ @ 0.8%	12.10	17.47 ^{bc}	21.13 ^{bc}	26.20 ^{bc}
RDF + FeSO ₄ @ 0.4%	11.80	21.50 ^{de}	25.53 ^{de}	30.60 ^{de}
RDF + FeSO ₄ @ 0.6%	12.63	25.67 ^g	29.70 ^g	34.77 ^h
RDF + FeSO ₄ @ 0.8%	11.93	22.20 ^e	26.23 ^{de}	31.30 ^{ef}
SE(m) ±	N/A	1.50	1.63	1.59
C.D. at 5%	0.40	0.50	0.55	0.53

1. DAP – Days after planting
2. N-S – North-South
3. RDF – Recommended dose of fertilizers
4. The superscript letter indicates that the treatment means with same letters are at par at 5% level of significance, while the means with different letters are significantly different at 5% level of significance. These letters have been affixed based on CD-value comparison of treatment means

Table 4: Effect of Ca and micro-nutrients on leaves per plant of strawberry cv. Nabila under net tunnel

Treatments	30 DAP	60 DAP	90 DAP	120 DAP
RDF + Water spray (Control)	7.27	15.30 ^a	27.33 ^a	38.40 ^a
RDF + CaCl ₂ @ 0.4%	6.70	17.20 ^{bc}	29.23 ^{bc}	40.30 ^{bc}
RDF + CaCl ₂ @ 0.6%	7.20	18.30 ^{cdefg}	30.31 ^{cdefg}	41.47 ^{cdefg}
RDF + CaCl ₂ @ 0.8%	6.90	16.80 ^b	28.83 ^b	39.90 ^b
RDF + ZnSO ₄ @ 0.4%	7.07	18.30 ^{cdefg}	30.33 ^{cdef}	41.20 ^{bcdef}
RDF + ZnSO ₄ @ 0.6%	7.33	19.40 ^{fgh}	31.10 ^{fgh}	42.33 ^{fgh}
RDF + ZnSO ₄ @ 0.8%	7.17	17.50 ^{bcd}	29.53 ^{bcd}	40.60 ^{bcd}
RDF + FeSO ₄ @ 0.4%	6.83	17.70 ^{bcde}	29.70 ^{bcde}	40.83 ^{bcde}
RDF + FeSO ₄ @ 0.6%	7.63	20.40 ^h	32.10 ^h	43.50 ^h
RDF + FeSO ₄ @ 0.8%	7.00	18.10 ^{bcdef}	30.13 ^{cdef}	41.20 ^{bcdef}
SE(m) ±	N/A	1.30	1.20	1.36
C.D. at 5%	0.37	0.44	0.40	0.45

1. DAP – Days after planting
2. RDF – Recommended dose of fertilizers
3. The superscript letter indicates that the treatment means with same letters are at par at 5% level of significance, while the means with different letters are significantly different at 5% level of significance. These letters have been affixed based on CD-value comparison of treatment means.

Table 5: Effect of foliar feeding of Ca and micro-nutrients on days to 1st flowering, days to 1st fruiting, days to maturity and number of runners per plant of strawberry cv. Nabila under net tunnel

Treatments	Number of runners /plant	Days to 1 st flowering	Days to 1 st fruiting	Days to maturity
RDF + Water spray (Control)	4.34 ^a	53.53 ^a	60.61 ^d	73.61 ^e
RDF + CaCl ₂ @ 0.4%	5.59 ^{def}	45.45 ^{bcd}	52.52 ^{bc}	65.70 ^{cd}
RDF + CaCl ₂ @ 0.6%	5.70 ^{def}	44.35 ^d	51.45 ^b	64.45 ^c
RDF + CaCl ₂ @ 0.8%	5.30 ^{cd}	46.65 ^{bc}	53.65 ^c	66.78 ^d
RDF + ZnSO ₄ @ 0.4%	5.66 ^{def}	46.90 ^b	53.90 ^c	66.90 ^d
RDF + ZnSO ₄ @ 0.6%	6.80 ^e	41.57 ^e	48.63 ^a	61.73 ^b
RDF + ZnSO ₄ @ 0.8%	4.72 ^{ab}	45.91 ^{bcd}	52.91 ^b	65.91 ^{cd}
RDF + FeSO ₄ @ 0.4%	5.33 ^{cde}	45.62 ^{bcd}	52.68 ^b	65.68 ^{cd}
RDF + FeSO ₄ @ 0.6%	9.09 ^h	40.17 ^f	47.24 ^a	57.24 ^a
RDF + FeSO ₄ @ 0.8%	4.99 ^{bc}	52.50 ^a	59.50 ^d	72.49 ^e
SE(m) ±	0.17	0.56	0.56	0.55
C.D. at 5%	0.51	1.67	1.69	1.66

1. RDF – Recommended dose of fertilizers
2. The superscript letter indicates that the treatment means with same letters are at par at 5% level of significance, while the means with different letters are significantly different at 5% level of significance. These letters have been affixed based on CD-value comparison of treatment means.

Days to fruit maturity

The minimum days to fruit maturity (57.24) was observed under the treatments T₈ (RDF + FeSO₄ @ 0.6%), which was followed by T₅ (RDF + ZnSO₄ @ 0.6%) having days to fruit maturity of 61.73. Moreover the treatments T₁, T₂, T₆ & T₇ and T₁, T₃, T₄, T₆ & T₇ having respective days to fruit maturity 65.70, 64.45, 65.91 & 65.68 and 65.70, 66.78, 66.90, 65.91 & 65.68 were observed non-significant different with each other under the present experiment. The Maximum days to fruit maturity (73.61) was recorded under the treatment T₀ (RDF + Control), which was at par with T₉ having 72.49 days to fruit maturity. The present results are in conformity with the findings of those reported by Yadlod and Kadam (2003) ^[11], Yadav *et al.* (2010) ^[12] in banana and Mehraj *et al.* (2015) ^[18] in strawberry.

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