

## VARIETAL PERFORMANCE OF STRAWBERRY (*FRAGARIA X ANANASSA DUCH.*) UNDER NALANDA REGION OF BIHAR

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**Abstract:** Strawberry (*Fragaria x ananassa* Duch) is basically temperate fruit crop and commercially grown round the year in Himanchal Pradesh and Jammu Kashmir but Northern India has also tropical and subtropical condition during November to March which provides opportunity for successful cultivation. Therefore, this experiment was formulated to assess the adaptability of strawberry varieties in Nalanda region of Bihar during 2013-14. The experiment was started with five varieties of strawberry namely Douglas, Missionary, Camarosa, Banglora and Chandler and observed that significant number of fruits per plant (26), fruit length (35.03mm), fruit diameter (31.54mm), average fruit weight (9.93g), yield per plant (266 g) and yield (148.05 q/ha) were recorded in the Douglas variety followed by in Chandler, Camarosa, Missionary and Banglora while highest total soluble solids were found in Banglora variety with 8.53 per cent.

**Keyword:** Strawberry, varieties, yield, performance

### INTRODUCTION

Strawberry (*Fragaria × ananassa* Duch.) is an attractive, luscious, tasty and nutritious fruit with a distinct and pleasant aroma, flavour, taste etc. utilized for fresh consumption, freezing, preparation of jam, jelly, syrup etc. It is popular fruit in all over the world wherever suitable climate, soil and moisture are available. In India strawberry is basically classified as temperate fruit and cultivated round the year in hilly areas but due to high temperature during summer in tropical and sub-tropical part of North India its cultivation is confined to the winter season. In India, It is cultivated in an area of 0.21 thousand hectare with production of 1.61 thousand MT [1]. America ranks first position with 27 per cent in the production of strawberry [2]. It is commercially cultivated in Canada, USA, Japan, Spain, Germany, Korea, Italy, Poland, Thailand and so many other countries in the world [3].

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Several varieties and genotypes are available for cultivation in strawberry but photo and/or thermo sensitive nature of this crop warrants the testing of these genotypes for adaptability in new areas before recommendation for commercial cultivation. Keeping in view of its popularity and increasing demand in India as well as in Bihar, an investigation was undertaken to assess the performance of different strawberry varieties in Nalanda region of Bihar.

## **MATERIAL AND METHODS**

The experiment was conducted at the research farm of Nalanda College of Horticulture, Noorsarai, Nalanda, Bihar Agricultural University Sabour, Bhagalpur, Bihar which is situated at about 10 km far from Nalanda district head quarter and 65 km from Patna city at 25.2748 latitude and 85.4569 longitude and 57 meters above the mean sea level. The experimental materials comprising of five varieties of strawberry namely, Douglas, Missionary, Camarosa, Banglora and Chandler were planted in Randomized Block design with three replications during 2013-14. Runners were planted at well prepared raised bed of 0.90m x 5m x 0.45 m (Width x Length x Height) having proper irrigation and drainage facilities and 45 cm irrigation channel- cum- path was left out between two beds. The two rows of runners were planted at each bed at the spacing of 40cm row to row and 30cm from plant to plant. Before planting, runners were treated with Carbendazim @ 2g/l of water to avoid possibilities of fungal infection. Light irrigation was done with watering cane up to establishment of the plant and bed was mulched with paddy straw. Proper moisture was maintained by providing frequent irrigation through irrigation channel prepared between two beds. The crop was fertilized with 2.5 kg FYM /sqm<sup>-1</sup> as basal dose and 19:19:19 grade of NPK mixture was applied fortnightly in the form of liquid near root zone with the help of watering cane. All the recommended package of practices was adopted to have a good crop. Five plants from each plot were selected randomly excluding border plants and observations were recorded on Days to first flowering, Number of fruits per plant, Fruit length (mm), Fruit diameter(mm), Average fruit weight (g), Fruit yield per plant (g) and Yield (q /ha). Total Soluble Solids (%) were measured by digital refractometer. The data recorded for all the traits were subjected for statistical analysis as per the procedure suggested by Panse and Sukhatme [4]. The critical difference at 5% probability level was also calculated to draw the valid conclusion.

## **RESULT AND DISCUSSION**

Data presented in the Table-1 revealed significant differences in all the varieties studied for different yield traits. Among all the varieties studied, Douglas was taken minimum days to

first flowering (35.25 days) followed by Chandler (50 days) while Banglora variety of strawberry taken maximum days to first flowering (54.50 days). Number of fruits per plant, being an important yield attributing trait, were also counted highest in Douglas (26.00) followed by Missionary (20.50) with least number of fruits per plant in Banglora (17.25).

Fruit length and fruit diameter was measured with the help of digital Caliper and significant variation was observed among all varieties involved under study. Beyond the expectation, variety Douglas proclaimed highest values for fruit length and diameter with 35.03 mm and 31.54 mm, respectively. The highest average fruit weight was recorded in variety Douglas (9.93 g) followed by Chandler (9.02 g) and Camarosa (8.39 g), while the minimum average fruit weight was weighed in Banglora with 6.72 g.

Highest yield is the ultimate goal of commercial growers of concerned crop and in this direction significantly maximum fruit yield per plant i.e. 266.50 g was recorded in the variety Douglas followed by Chandler (170.40g) and Camarosa (168.43g) whereas, lowest fruit yield per plant 121.75 g was found in variety Banglora (fig-1). The fruit yield (q/ha) was also calculated and Figure-1 proved the assumption as significant maximum fruit yield (148.05 q/ha) was yielded by the variety Douglas followed by Chandler (94.67 q/ha) and Camarosa (93.57 q/ha).

Total soluble solid (TSS) is an important factor in fruit crops and present study has proven that varieties used under study were also variable for the trait concern. From the present study, it is evident that TSS content was maximum in the variety Banglora with 8.53 per cent followed by Chandler (7.74 per cent) and Camarosa (7.74 per cent). Least value for TSS was obtained in Douglas (6.35 %). In corroborant to our findings, while working on performance of strawberry cultivar on different mulching material under Subtropical plateau condition of Eastern India also reported the highest average fruit weight and yield in case of Douglas followed by Etna variety of strawberry [5].

The study revealed that Douglas variety of strawberry had shown better adoptability with respect to number of fruits/plant, average fruit weight (g), fruit yield/plant(g) and fruit yield (q/ha) as compared to Missionary, Camarosa, Banglora and Chandler in the Nalanda region of Bihar. Further studies are also required to standardize its cultivation package and practices in this region.

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**Table-1. Mean values of five varieties for the eight characters of Strawberry (*Fragaria x ananassa* Duch.) under Nalanda region of Bihar**

| Treatment    | Days to first flowering | No. of fruit per plant | Fuit length (mm) | Fruit diameter (mm) | Average fruit wt. (g) | Fruit yield per plant (g) | Yield (q/ha) | TSS (%)     |
|--------------|-------------------------|------------------------|------------------|---------------------|-----------------------|---------------------------|--------------|-------------|
| Douglas      | 35.25                   | 26.00                  | 35.03            | 31.54               | 9.93                  | 266.50                    | 148.05       | 6.35        |
| Missionary   | 53.00                   | 20.50                  | 26.00            | 23.17               | 6.85                  | 148.93                    | 82.74        | 7.04        |
| Chandler     | 50.00                   | 18.50                  | 33.20            | 28.01               | 9.02                  | 170.40                    | 94.67        | 7.74        |
| Banglora     | 54.50                   | 17.25                  | 22.23            | 25.57               | 6.72                  | 121.75                    | 67.64        | 8.53        |
| Camarosa     | 52.75                   | 19.50                  | 27.78            | 23.94               | 8.39                  | 168.43                    | 93.57        | 7.78        |
| <b>C.D.</b>  | <b>3.53</b>             | <b>3.45</b>            | <b>3.63</b>      | <b>4.20</b>         | <b>1.87</b>           | <b>63.67</b>              | <b>35.37</b> | <b>0.75</b> |
| <b>SE(m)</b> | <b>1.13</b>             | <b>1.11</b>            | <b>1.17</b>      | <b>1.35</b>         | <b>0.60</b>           | <b>20.44</b>              | <b>11.35</b> | <b>0.24</b> |
| <b>SE(d)</b> | <b>1.60</b>             | <b>1.57</b>            | <b>1.65</b>      | <b>1.91</b>         | <b>0.85</b>           | <b>28.90</b>              | <b>16.06</b> | <b>0.34</b> |
| <b>C.V.</b>  | <b>4.61</b>             | <b>10.88</b>           | <b>8.08</b>      | <b>10.19</b>        | <b>14.64</b>          | <b>23.33</b>              | <b>23.33</b> | <b>6.39</b> |

