

Effect of organic manures on plant growth and fruit yield of strawberry (*Fragaria x ananassa* Duch) cv Chandler

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ABSTRACT

The investigations were undertaken in the Department of Horticulture, Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad during Rabi season (2014-2015) to see the effect of organic manures on plant growth and fruit yield of strawberry (*Fragaria x ananassa* Duch) cv Chandler. The experiment was laid out in randomized block design having 12 treatments and 3 replications. The treatment comprising vermicompost @ 8 tonnes/ha + poultry manure @ 6 tonnes/ha was found to be statistically significant compared to other treatment combinations which recorded highest plant height (24.27 cm), plant spread (33.80 cm), number of leaves/plant (14.07), petiole length (8.53 cm), number of flowers/plant (3.20) and number of fruits/plant (92.83 g). The highest yield was also obtained under the same followed by vermicompost @ 8 tonnes/ha and lowest was obtained under the treatment comprising poultry manure @ 6 tonnes/ha + sheep manure @ 12 tonnes/ha.

Keywords: Strawberry; manure; vermicompost; growth; yield

INTRODUCTION

The modern cultivated strawberry (*Fragaria x ananassa* Duch) is one of the most delicious and refreshing soft fruit worldwide and is the most widely distributed fruit crop due to the genotypic diversity, highly heterozygous nature and broad range of environmental adaptations.

Organic manures are the plant and animal wastes that are used as nutrients after decomposition. Organic manures when added to soil undergo microbial decomposition. In that process the nutrients held in organic combinations are slowly released in available forms besides improving the availability of nutrient elements present in the soil. In addition the organic carbon level of the soil also increases when the manures are used continuously. Moreover they greatly stimulate the living phase of the soil. This helps not only in biodegradation but also in nitrogen fixation, phosphorus solubility and increasing the availability of plant nutrients to the crops. Adhikari et al (1997) observed that the crop yields and microbial activities decreased with decreasing levels

of organic carbon status in soil. The complex property of organic manures influenced the availability and mobility of the micronutrients.

MATERIAL and METHODS

The present investigations were carried out at horticultural field of the SHIATS, Allahabad, Uttar Pradesh during November 2014 to April 2015. The different treatments used were T₁ (Control, recommended dose of fertilizers), T₂ (Compost 25 tonnes/ha), T₃ (Poultry manure 6 tonnes/ha), T₄ (Vermicompost 8 tonnes/ha), T₅ (Sheep manure 12 tonnes/ha), T₆ (FYM 30 tonnes/ha), T₇ (Vermicompost 8 tonnes/ha + sheep manure 12 tonnes/ha), T₈ (Vermicompost 8 tonnes/ha + poultry manure 6 tonnes/ha), T₉ (Poultry manure 6 tonnes/ha + sheep manure 12 tonnes/ha), T₁₀ (Poultry manure 6 tonnes/ha + compost 25 tonnes/ha), T₁₁ (FYM 30 tonnes/ha + vermicompost 8 tonnes/ha) and T₁₂ (FYM 30 tonnes/ha + vermicompost 8 tonnes/ha + poultry manure 6 tonnes/ha). The treatments were arranged in a randomized block design with 12 treatments comprising 3 replications.

RESULTS and DISCUSSION

The data on the effect of different treatments on the growth, flowering, yield attributes and yield of strawberry are given in Table 1.

Growth parameters

The maximum plant height (24.27 cm) was observed in T₈ (Vermicompost 8 tonnes/ha + poultry manure 6 tonnes/ha) followed by T₄ (Vermicompost @ 8 tonnes/ha, 21.80 cm) as against minimum plant height (17.67 cm) in T₉ (Poultry manure 6 tonnes/ha + sheep manure 12 tonnes/ha).

Maximum plant spread (33.80 cm) was observed in T₈ followed by T₄ (31.00 cm). The minimum plant spread (23.00 cm) was observed in T₉. The results are in close conformity with the findings of Abu-Zahira and Tahboub (2008).

The maximum number of leaves per plant (14.07) was also observed in T₈ followed by T₄ (12.13) and minimum (8.20) in T₉. Similar results were reported by Wang and Lin (2006).

The maximum petiole length (8.53 cm) was observed in T₈ followed by T₄ (7.80 cm) and minimum (6.20 cm) in T₉. The results are in accordance with the findings of Patel and Meisheri (1997).

Floral characteristics

The first flowering (46.60 days) was observed in T₈ followed by T₄ (47.53 days) as against late flowering (62.33 days) in T₉.

The maximum number of flowers per plant (3.20) was observed in T₈ followed by T₄ (2.33) and minimum (1.67) in T₉. The results are similar to the findings of Kale et al (1987).

Yield

The highest fruit yield per plant (92.83 g) was observed in T₈ followed by T₄ (87.63 g) and lowest (25.47 g) in T₉.

Highest fruit yield per plot (556.98 g) was also observed in T₈ followed by T₄ (525.78 g) with minimum (152.82 g) in T₉.

Table 1. Effect of different organic manures on growth parameters and fruit yield of strawberry cv Chandler

Treatment	Plant height (cm)	Plant spread (cm)	Number of leaves/plant	Petiole length (cm)	Days taken to first flowering	Number of flowers/plant	Fruit yield /plant (g)	Fruit yield plot (g)	Fruit yield /ha (q)
T ₁	20.87	27.40	9.20	7.20	56.13	2.07	32.47	194.82	19.48
T ₂	20.27	26.67	8.67	7.07	60.73	2.07	27.17	163.02	16.30
T ₃	19.47	26.60	8.67	7.13	61.87	1.93	26.73	160.38	16.03
T ₄	21.80	31.00	12.13	7.80	47.53	2.33	87.63	525.78	52.57
T ₅	18.20	23.60	8.47	7.20	64.47	1.93	26.57	159.42	15.94
T ₆	20.20	26.47	8.47	6.47	59.73	2.00	28.20	169.20	16.92
T ₇	20.00	26.13	8.73	7.40	59.00	2.20	28.20	169.20	16.92
T ₈	24.27	33.80	14.07	8.53	46.60	3.30	92.82	556.98	55.69
T ₉	17.67	23.00	8.20	6.20	62.33	1.67	25.47	152.82	15.28
T ₁₀	21.73	27.93	9.80	7.40	54.07	2.00	36.30	217.08	21.70
T ₁₁	20.80	28.33	9.20	6.93	54.13	2.13	36.57	219.42	21.94
T ₁₂	20.73	30.00	10.00	7.67	54.33	2.07	69.57	417.42	41.74
SEd	S	S	S	S	S	S	S	S	S
CD	0.34	0.56	0.38	0.19	1.97	0.28	0.34	0.72	0.07
F-test	0.72	1.17	0.79	0.40	4.09	0.57	0.70	1.49	0.15

T₁ = Control, T₂ = Compost 25 tonnes/ha, T₃ = Poultry manure 6 tonnes/ha, T₄ = Vermicompost 8 tonnes/ha, T₅ = Sheep manure 12 tonnes/ha, T₆ = FYM 30 tonnes/ha, T₇ = Vermicompost 8 tonnes/ha + sheep manure 12 tonnes/ha, T₈ = Vermicompost 8 tonnes/ha + poultry manure 6 tonnes/ha, T₉ = Poultry manure 6 tonnes/ha + sheep manure 12 tonnes/ha, T₁₀ = Poultry manure 6 tonnes/ha + compost 25 tonnes/ha, T₁₁ = FYM 30 tonnes/ha + vermicompost 8 tonnes/ha, T₁₂ = FYM 30 tonnes/ha + vermicompost 8 tonnes/ha + poultry manure 6 tonnes/ha

Thus the highest fruit yield per hectare (55.69 q) was observed in T₈ followed by T₄ (52.57 q) and minimum (15.28 q) in T₉. The results are in close agreement with the findings of Abu-Zahira and Tahboub (2008).

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