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## Evaluation of dragon fruit (*Hylocereus undatus* L.) under Kanpur cropping condition to estimates the effect of N:P:K and organic manure

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### Abstract

Present study conducted at research farm of FASAI, Rama University, Kanpur during rabi 2022-2023 to determine the N.P.K and organic manure effect of growth and yield of dragon fruit (*Hylocereus polyrhizus*) under Kanpur cropping condition. Experiment trial have been conducted in RBD with 3 replication using 11 different treatment viz., viz. T<sub>0</sub> = Control, T<sub>1</sub> = NPK (100% RDF), T<sub>2</sub> = NPK (50% RDF) + 45% FYM, T<sub>3</sub> = NPK (50% RDF) + 45% poultry manure, T<sub>4</sub> = NPK (50% RDF) + 45% vermicompost, T<sub>5</sub> = NPK (25% RDF) + 65% FYM, T<sub>6</sub> = NPK (25% RDF) + 65% poultry manure, T<sub>7</sub> = FYM (25% RDF) + 65% vermicompost, T<sub>8</sub> = 100% F.Y.M, T<sub>9</sub> = 100% vermicompost and T<sub>10</sub> = 100% poultry manure. Experimental finding shows extreme plant height 46.78 cm, Total branches per plant 4.23 and main stem diameter (22.54 cm), plant canopy (N to S: 16.44 cm<sup>3</sup>), plant canopy (E to W: 19.38 cm<sup>3</sup>), total sprouting 6.35, New shoots height (58.11), and survival percentage (100%) of plant were recorded for T<sub>4</sub> (NPK: 50% RDF + 50% vermicompost) followed by T<sub>3</sub> (NPK (50% RDF) + 50% poultry manure). Experimental control exhibited least performance in comparison to all treatment.

**Keywords:** NPK, vermicompost, FYM, poultry manure, RDF

### Introduction

Dragon fruit (*Hylocereus polyrhizus*) belongs to the Cactaceae family (Cactaceae) and is originally native to North, Central, and South America. Dragon fruit requires a warm climate, so it grows well even in semi-arid tropics, generally grown in tropical and subtropical regions and is non-menopausal fruit. Ripe *H. Polyrhizus* fruits have an attractive red-purple skin, and the flesh was soft and juicy, containing small black seeds. Since this fruit was recommended as healthy fruits, many countries such as Nicaragua, Colombia, Vietnam, Australia, United States, Thailand, Taiwan (Merten, 2003 and Jamilah *et al.*, 2011) [6, 7], and Malaysia have grown *H. polarize*. Eat lean *H.*). It's a long-day plant which produces beautiful flower on blooming at night, and known as Lady or "Queen of the Night". The fruit is one of the most beautiful fruits of the cactus family, large size, bright red skin with green scales, no rough surface, red flesh containing small black seeds, easy to swallow. Average fruit weight is 360 g. The fruit tastes best when ripened when fully red and breathless. The main advantage of this fruit is that it can be planted and grown for 20 years, and 1,000 to 2,000 dragon fruit trees can be planted per hectare.

### Materials and Methods

Current experiment "Effect of nitrogen, phosphorus, potassium and organic fertilizers on growth and development of dragon plant (*Hylocereus polyrhizus*) under Kanpur agroclimatic conditions" cv. The "Red Meat" program is implemented in the experimental areas of the Department of Horticulture of Rama University, under the agro-climatic conditions of Kanpur. The test area is between 24,470 and 26,560 degrees North and 83,120- and 80,660-degrees East Longitude. Annual rainfall in the area is about 1,012.4 mm. The soil in the experimental area was 65% sand, 26% silt, 14% silt, pH 7.2, and EC soil. (dSm<sup>-1</sup>) at 250 °C is 0.28, carbon dioxide 0.35%.

Treatments combination

T <sub>0</sub>	Control
T <sub>1</sub>	NPK (100% RDF)
T <sub>2</sub>	NPK (50% RDF) + 45% FYM
T <sub>3</sub>	NPK (50% RDF) + 45% poultry manure
T <sub>4</sub>	NPK (50% RDF) + 45% vermicompost
T <sub>5</sub>	NPK (25% RDF) + 65% FYM
T <sub>6</sub>	NPK (25% RDF) + 65% poultry manure
T <sub>7</sub>	FYM (25% RDF) + 65% vermicompost
T <sub>8</sub>	100% F.Y.M
T <sub>9</sub>	100% vermicompost
T <sub>10</sub>	100% poultry manure

**Table 1:** Effect of N.P.K and organic manure on plant growth of dragon fruit

Trt.	Trt. combination	Plant height (cm)	Number of branches	Main stem circumference (cm)	Plant canopy north to south (cm)	Plant canopy east to west (cm)	Number of sprouting	New shoots height (cm)
T <sub>0</sub>	Control	34.66	2.77	8.88	10.44	8.44	3.05	30.22
T <sub>1</sub>	NPK (100% RDF)	38.39	3.00	9.14	11.00	11.00	3.44	39.11
T <sub>2</sub>	NPK (50% RDF) + 45% FYM	45.33	3.66	13.97	14.89	16.22	4.66	57.44
T <sub>3</sub>	NPK (50% RDF) + 45% poultry manure	47.11	3.89	14.78	16.78	17.22	5.00	57.89
T <sub>4</sub>	NPK (50% RDF) + 45% vermicompost	46.78	4.23	22.54	16.44	19.38	6.35	58.11
T <sub>5</sub>	NPK (25% RDF) + 65% FYM	40.77	3.55	11.16	12.77	13.33	4.22	46.11
T <sub>6</sub>	NPK (25% RDF) + 65% poultry manure	42.11	3.33	11.83	13.22	13.54	3.77	49.55
T <sub>7</sub>	FYM (25% RDF) + 65% vermicompost	43.11	3.66	11.92	13.33	14.00	4.44	51.44
T <sub>8</sub>	100% F.Y.M	38.33	3.44	9.36	11.44	11.55	4.00	44.44
T <sub>9</sub>	100% vermicompost	40.33	3.00	11.02	12.55	12.77	4.11	45.55
T <sub>10</sub>	100% poultry manure	39.33	3.55	9.72	12.44	12.33	4.11	44.53
F- test		S	S	S	S	S	S	S
S. Ed. (±)		3.313	0.380	2.692	1.265	1.031	0.399	5.705
C. D. (P = 0.05)		6.838	0.785	5.556	2.610	2.129	0.824	11.774

## Results and Discussion

Experimental finding exhibits significant increasing on average maximum plant height (47.78 cm) in 180 Days, Larcher (2000)<sup>[2]</sup>, followed by number of branches (4.22) and main stem circumference (22.55 cm) plant canopy (N to S: 17.44cm<sup>3</sup>), plant canopy (E to W: 20.38 cm<sup>3</sup>), number of sprouting (6.33), new shoots height (59.11), and Survival % (100%) for treatment T<sub>4</sub> (NPK (50% RDF) + 50% vermicompost).

Highest plant height has been observed in T<sub>4</sub> (NPK 50% RDF + 50% vermicompost) with (47.78 cm), followed by T<sub>3</sub> (NPK 50% RDF + 50% poultry manure) with (47.11 cm) while lowest plant height, recorded in T<sub>0</sub> (control) with (34.66 cm).

Highest plant height had been observed in T<sub>4</sub> (NPK 50% RDF + 50% vermicompost) (47.78 cm), followed by T<sub>3</sub> (NPK 50% RDF + 50% poultry manure) with (47.11 cm) while least value of plant height has been observed for T<sub>0</sub> (control) with (34.66 cm).

The extreme value for branches/plant has been observed in T<sub>4</sub> (NPK 50% RDF + 50% vermicompost) (4.22), trailed by T<sub>3</sub> (NPK 50% RDF + 50% poultry manure) (3.89) whereas it has been observed least in T<sub>0</sub> (control) with (2.77).

The least first sprouting days recorded in T<sub>4</sub> (NPK 50% RDF + 50% vermicompost) (20.66), tracked by T<sub>3</sub> (50% RDF + 50%

poultry manure) (22.44) and maximum sprouting days value noted in T<sub>0</sub> (control) with (58.77).

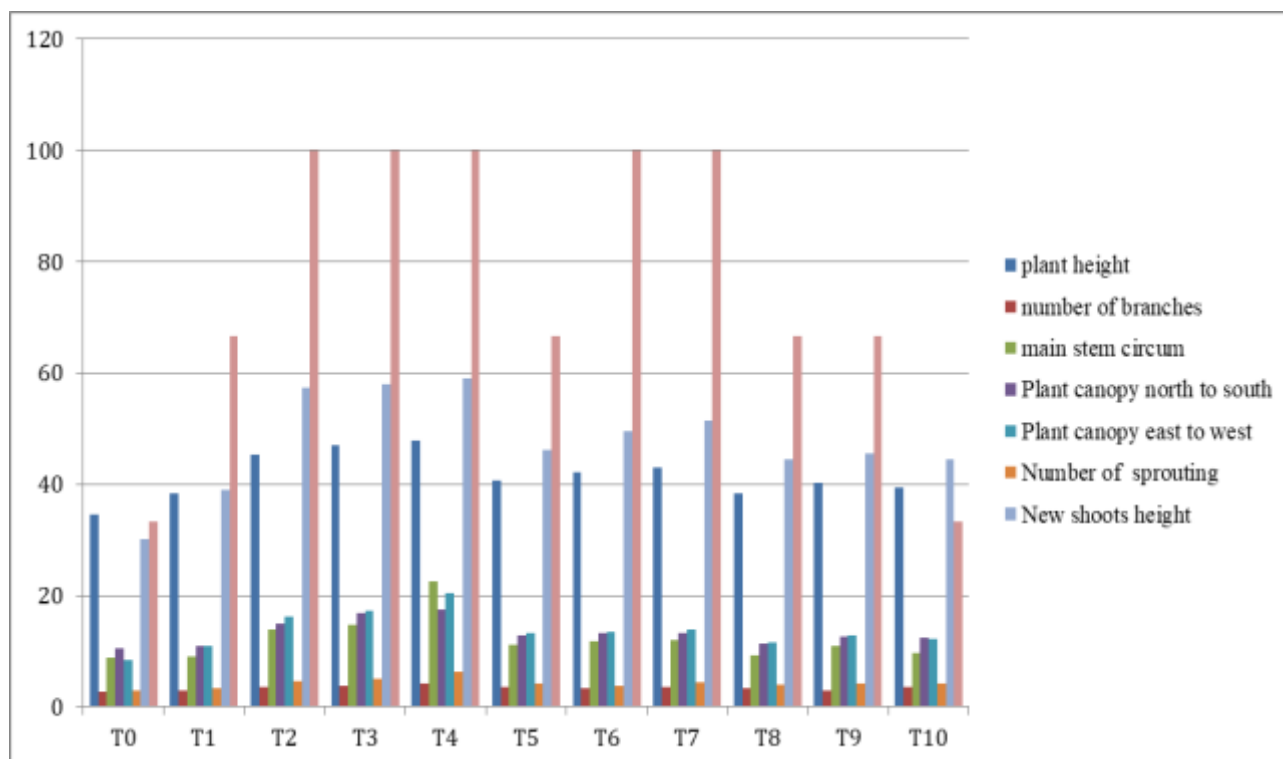
Highest new shoots height noted in T<sub>4</sub> (NPK 50% RDF + 50% vermicompost) (59.11), followed by T<sub>3</sub> (50% RDF + 50% poultry manure) (57.89) and it has been reported lower in T<sub>0</sub> (control) (30.22).

Highest value of canopy N to S (North to South) was recorded in T<sub>4</sub> (NPK 50% RDF + 50% vermicompost) (17.44) followed by T<sub>3</sub> (NPK 50% RDF + 50% poultry manure) with (16.78) while the minimum was recorded in T<sub>0</sub> (control) with (10.44).

T<sub>4</sub> (NPK 50% RDF + 50% vermicompost) with (20.38) exhibited highest plant canopy (E to W) and T<sub>3</sub> (50% RDF + 50% poultry manure) showed 17.22 while lowest value has been recorded in T<sub>0</sub> (control) with (8.44).

Highest sprouting/plant noted in T<sub>4</sub> (NPK 50% RDF + 50% vermicompost) (6.33), trailed by T<sub>3</sub> (50% RDF + 50% poultry manure) (5.00). While control (T<sub>0</sub>- 3.05) exhibited least sprouting/plant.

T<sub>4</sub> (NPK 50% RDF + 50% vermicompost) and T<sub>3</sub> (50% RDF + 50% poultry manure) shown 100% plant survival while it was noted in T<sub>0</sub> (control) (33.33).



**Fig 1:** Effect of N.P.K and organic manure on plant growth of dragon fruit

### Conclusion

Present finding reveals that treatment T<sub>4</sub> (NPK (50% RDF) + 45% vermicompost) was found beneficial in terms of maximum vegetative growth (46.78 cm) and maximum fruit yield. So, this treatment combination is suggested to the farmer to get healthy plants and maximum yield. Its treatment combination results the 100-plant survival so ultimate loss due to death could be stopped thus helps in loss management.

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