

Effect of N.P.K and organic manure & on plant growth in Dragon fruit (*Hylocereu polyrhizus*) under Kanpur agro climatic condition cv. Red Flesh

Saloni Singh, Monika Yadav, Jitendra Kumar, Vinay Joseph Silas,

Department Of Applied Sciences & Humanities (Environmental Science), Faculty of Engineering & Technology, Rama University, Kanpur- 209 217 (U.P), India
Faculty of Agricultural Sciences and Allied Industries, Rama University, Kanpur- 209 217 (U.P), India

E-mail: singhsaloni038@gmail.com

ABSTRACT

In winter 2022–2023, a study titled "Studies on N.P.K and organic manure on plant growth and establishment of dragon fruit (*Hylocereus polyrhizus*) under Kanpur agro climatic condition" cv. Red Flesh was carried out at the research farm of the Department of Horticulture, Rama University, Kanpur. The 11 treatments in the experiment were duplicated three times and were set up in a randomized block design. therapies that include viz. Using T0 as the control, T1 as NPK (100% RDF), T2 as NPK (50% RDF)+45% FYM, T3 as NPK (50% RDF)+45% poultry manure, T4 as NPK (50% RDF)+45% vermicompost, T5 as NPK (25% RDF)+65% FYM, and T6 as NPK (25% RDF)+65% vermicompost +65% FYM (25 percent RDF) +65% poultry manure, T7 = 100% F.Y.M., T9 = 100% vermicompost, and T10 = 100% poultry manure. Plant canopy north to south (16.44cm³), plant canopy east to west (19.38cm³), maximum plant height (46.78 cm), number of branches (4.23), and main stem circumference (22.54cm) were all revealed by the results number of sprouting (6.35), New shoots height (58.11), and survival percentage (100%) of plant were recorded in T₄ (NPK(50% RDF)+50% vermicompost) followed by T₃ (NPK (50% RDF)+50% poultry manure). The least values were recorded in the control.

Key words: NPK, Vermicompost, Fym, Poultry manure, RDF.

Introduction

The cactus family, Cactaceae, includes dragon fruits (*Hylocereus polyrhizus*), which are native to North, Central, and South America. Due to its climatic requirements, dragon fruit grows best in semi-arid regions. A crop found in tropical and subtropical regions is dragon fruit. This fruit is not climacteric. The *H. polyrhizus* fruit was beautifully ripened, with a purple-red peel and soft, succulent flesh containing tiny black seeds. Many nations, including Nicaragua, Colombia, Vietnam, Australia, the United States, Thailand, and Taiwan, have been promoting this fruit as a nutritious food (Merten, 2003 and Jamilahet al., 2011). Additionally, Malaysia has begun to market *H. polyrhizus*. Pitaya peels make up 22% of the entire fruit and are rich in pectin, the pigment betacyanin, and total dietary fiber (Jamilahet al., 2011). Consuming red-fleshed *H. polyrhizus* fruit has been shown to improve bone density, guard against constipation and colon cancer (Anon, 2007a). Large investors were drawn to these factors along with the possibility of a

strong financial return. Common names in English included Honolulu Queen, queen of the night, strawberry pears, night-blooming careus, and pitaya and pitahaya in Latin America. Due to its fruit quality and ornamental characteristics, it is favored by many. Known as "Noble Woman" or "Queen of the Night," this plant has a long day and a beautiful flower that blooms at night. Typically, flowering begins with. Its fruit is the most beautiful in the family cactaceae with an immense shape, bright red skin studded with green scales, no surface spines and red flesh with tiny readily swallowed black seeds. Average fruit weight is 360 g. The fruit is non climacteric with best flavor when harvested at full red color. The juicy flesh of the fruit is delicious in taste which contains 70-80% of the ripe fruit. The biggest advantage of this crop is that once planted, it will grow for about 20 years and one hectare could accommodate 1000 to 2000 dragon fruit plants.

Materials and Methods

At the experimental field of the Department of Horticulture, Rama University, a field experiment named "Effect of N.P.K and organic manure on plant growth and establishment of Dragon fruit (*Hylocereupolyrhizus*) under Kanpur agro climatic condition" cv. Red Flesh will be conducted. The location of the experimental site is between latitudes 24.470 and 26.560N and longitudes 83.120 and 80.660 E. The location's maximum temperature is between 45 and 46 degrees Celsius, with rare dips to 4 or 5 degrees Celsius. There was a 20–94% range in the relative humidity.

Treatments combination

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

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

Notations	Treatments 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 ₀	Control	34.66	2.77	8.88	10.44	8.44	3.05	30.22
T ₁	NPK (100% RDF)	38.39	3.00	9.14	11.00	11.00	3.44	39.11
T ₂	NPK(50% RDF)+45% FYM	45.33	3.66	13.97	14.89	16.22	4.66	57.44
T ₃	NPK (50% RDF)+45% poultry manure	47.11	3.89	14.78	16.78	17.22	5.00	57.89
T ₄	NPK(50% RDF)+45% vermicompost	46.78	4.23	22.54	16.44	19.38	6.35	58.11
T ₅	NPK(25% RDF)+65% FYM	40.77	3.55	11.16	12.77	13.33	4.22	46.11
T ₆	NPK(25% RDF)+65% poultry manure	42.11	3.33	11.83	13.22	13.54	3.77	49.55
T ₇	FYM(25% RDF)+65% vermicompost	43.11	3.66	11.92	13.33	14.00	4.44	51.44
T ₈	100% F.Y.M	38.33	3.44	9.36	11.44	11.55	4.00	44.44
T ₉	100% vermicompost	40.33	3.00	11.02	12.55	12.77	4.11	45.55
T ₁₀	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

Result and discussion

Research revealed that treatment T₄ (NPK(50% RDF)+50% vermicompost) had a significant effect on the average maximum plant height (47.78 cm) in 180 days, Larcher (2000), number of branches (4.22) and main stem circumference (22.55 cm), plant canopy north to south (17.44 cm³), plant canopy east to west (20.38 cm³), number of sprouting (6.33), height of new shoots (59.11), and survival percentage (100%).

T₄ (NPK 50% RDF+50% vermicompost) had the highest plant height, measuring 47.78 cm; T₃ (NPK 50% RDF+50% poultry manure) came in second with 47.11 cm; and T₀ (control) had the lowest plant height, measuring 34.66 cm.

T₄ (percentage RDF+50% vermicompost) had the largest plant circumference (22.55), followed by T₃ (percentage RDF+50% poultry manure) with (14.78), and T₀ (control) had the smallest plant circumference (8.88). The maximum number of branches were recorded in T₄ (NPK50% RDF+50% vermicompost) with (4.22), followed by T₃ (NPK 50% RDF+50% poultry manure) with (3.89) and the minimum was recorded in T₀ (control) with (2.77).

The minimum days taken to first sprouting was recorded in T₄ (NPK50% RDF+50% vermicompost) with (20.66), followed by T₃ (50% RDF+50% poultry manure) with (22.44) and the maximum was recorded in T₀ (control) with (58.77).

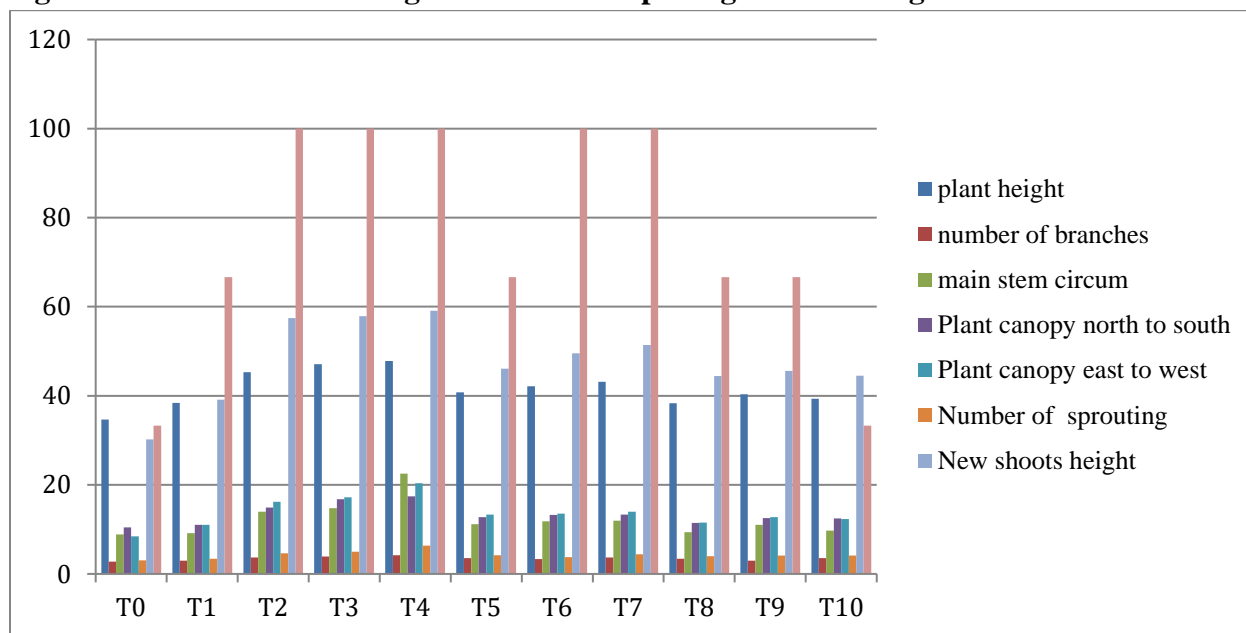
The maximum New shoots height was recorded in T₄ (NPK50% RDF+50% vermicompost) with (59.11), followed by T₃ (50% RDF+50% poultry manure) with (57.89) and the minimum was recorded in T₀ (control) with (30.22).

The maximum plant canopy north to south was recorded in T₄ (NPK50% RDF+50% vermicompost) with (17.44) followed by T₃ (NPK 50% RDF+50% poultry manure) with (16.78) and the minimum was recorded in T₀ (control) with (10.44). T₄ (NPK50% RDF+50% vermicompost) had the maximum plant canopy east to west, measured at (20.38). T₃ (50% RDF+50% poultry manure) came in second with (17.22), and T₀ (control) had the lowest plant canopy, measured at (8.44).

Maximum sprouting per plant was measured in T₄ (NPK50% RDF+50% vermicompost) with 6.33, minimum was measured in T₀ (control) with 3.05, and maximum was measured in T₃ (50% RDF+50% poultry manure) with 5.00.

T₄ (NPK50% RDF+50% vermicompost) had the highest recorded Survival% (100%), followed by T₃ (50% RDF+50% poultry manure) (100%), and T₀ (control) had the lowest (33.33%).

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



Conclusion

On the basis of results obtained, It is concluded that the treatment T₄ (NPK(50% RDF)+45% vermicompost) was found beneficial in terms of maximum vegetative growth (46.78 cm)

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