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Effect of N.P.K and organic manure on establishment and plant growth of dragon fruit (*Hylocereus polyrhizus*) Under Allahabad agro climatic condition Cv. red flesh

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Abstract

An experiment was conducted at the research farm, Department of Horticulture, Sam Higginbottom University of Agriculture Technology and Science, Allahabad during winter. - (Nov -April) of 2017-2018 to study the "Effect of N.P.K and organic manure on plant growth and establishment of dragon fruit (*Hylocereus polyrhizus*) under Allahabad agro climatic condition" cv. Red Flesh. Experiment was laid out in randomized block design with 11 treatments replicated thrice. Treatments comprising viz. T₀ = Control, T₁ = NPK (100% RDF), T₂ = NPK (50% RDF)+50% FYM, T₃ = NPK (50% RDF)+50% poultry manure, T₄ = NPK(50% RDF)+50% vermicompost, T₅ = NPK(25% RDF)+75% FYM, T₆ =NPK(25% RDF)+75% poultry manure, T₇ = FYM(25% RDF)+75% vermicompost, T₈ = 100% F.Y.M, T₉ = 100% vermicompost and T₁₀ = 100% poultry manure. The results revealed that maximum plant height (47.78 cm), number of branches (4.22) and main stem circumference (22.55cm), plant canopy north to south (17.44cm³), plant canopy east to west (20.38cm³), number of sprouting (6.33), New shoots height (59.11), 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.

Keywords: dragon fruit, vermicompost, fym, poultry manure, RDF

Introduction

Dragon fruits (*Hylocereus polyrhizus*) belong to the cactus family, cactaceae and it originated from North, Central and South America. Dragon fruit requires a warm climate thus prospers well in semi-arid areas. dragon fruit is a tropical and sub tropical region crop. it is non climacteric fruit The ripened *H. polyrhizus* fruit had an attractive purple-red peel and the flesh is soft and succulent with small black seeds. Since, this fruit are being promoted as a healthy food, many countries like Nicaragua, Colombia, Vietnam, Australia, United States, Thailand, Taiwan as well as Malaysia has started to commercialize *H. polyrhizus*. Pitaya peel constitutes 22% of the whole pitaya and it contained considerable amount of pectin, betacyanin pigment and total dietary fibre. Eating red-fleshed *H. polyrhizus* fruit was reported to increase bone density and prevent colon cancer and constipation. These factor, as well as the prospect of a good economic return, attracted big investors. English common names included night-blooming careus, strawberry pears, queen of the night and Honolulu Queen, Latin American names pitaya and pitahaya. It is favourite to many because of its ornamental characters and fruit quality. It is a long day plant with beautiful night blooming flower that is nick named as "Noble Woman" or "Queen of the Night". Usually flowering starts from April to November sometimes extending till December and occurs in four to six flushes. 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

A field experiment entitled "Effect of N.P.K and organic manure on plant growth and establishment of Dragon fruit (*Hylocereus polyrhizus*) under Allahabad agro climatic condition" cv. Red Flesh" will be carried out under Allahabad agro climatic conditions at the experimental field of the Department of Horticulture, Naini Agriculture Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad. The experimental site is situated at of latitude of 20° and 15° north and longitude of 60° 3" East and at an altitude of 98 meters above mean sea level (MSL). The maximum temperature of the location reaches up to 46°C-48°C and seldom falls as low as 4 °C- 5 °C. The relative humidity ranged between 20 to 94 percent. The average rainfall in this area is around 1013.4 mm annually. The soil of

experimental area had sand 60%, Silt 26%, Clay 14%, pH 7.2, Soil EC. (dSm-1) at 250C is 0.28, organic carbon 0.35%.

Treatments combination

T ₀	Control
T ₁	NPK (100%RDF)
T ₂	NPK (50%RDF)+50% FYM
T ₃	NPK (50% RDF)+50% poultry manure
T ₄	NPK(50% RDF)+50% vermicompost
T ₅	NPK(25% RDF)+75%FYM
T ₆	NPK(25% RDF)+75% poultry manure
T ₇	FYM(25%RDF)+75% 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)	Survival percentage %
T ₀	Control	34.66	2.77	8.88	10.44	8.44	3.05	30.22	33.33
T ₁	NPK (100%RDF)	38.39	3.00	9.14	11.00	11.00	3.44	39.11	66.66
T ₂	NPK (50%RDF)+50% FYM	45.33	3.66	13.97	14.89	16.22	4.66	57.44	100.00
T ₃	NPK (50% RDF)+50% poultry manure	47.11	3.89	14.78	16.78	17.22	5.00	57.89	100.00
T ₄	NPK(50% RDF)+50% vermicompost	47.78	4.22	22.55	17.44	20.38	6.33	59.11	100.00
T ₅	NPK(25% RDF)+75%FYM	40.77	3.55	11.16	12.77	13.33	4.22	46.11	66.66
T ₆	NPK(25% RDF)+75% poultry manure	42.11	3.33	11.83	13.22	13.54	3.77	49.55	100.00
T ₇	FYM(25%RDF)+75% vermicompost	43.11	3.66	11.92	13.33	14.00	4.44	51.44	100.00
T ₈	100% F.Y.M	38.33	3.44	9.36	11.44	11.55	4.00	44.44	66.66
T ₉	100% vermicompost	40.33	3.00	11.02	12.55	12.77	4.11	45.55	66.66
T ₁₀	100% poultry manure	39.33	3.55	9.72	12.44	12.33	4.11	44.53	33.33
F- test		S	S	S	S	S	S	S	S
S. Ed. (±)		3.313	0.380	2.692	1.265	1.031	0.399	5.705	0.091
C. D. (P = 0.05)		6.838	0.785	5.556	2.610	2.129	0.824	11.774	0.187

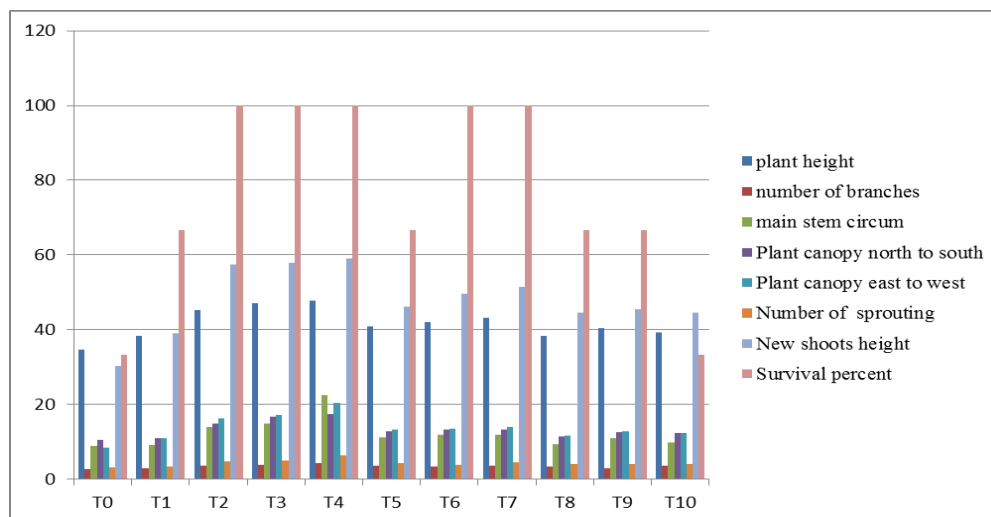


Fig 1: Effect of N.P.K and organic manure on plant growth of dragon fruit

Result and Discussion

Studies showed that significant effect was increasing on average maximum plant height (47.78 cm) in 180 Days, Larcher (2000) [2], number of branches (4.22) and main stem circumference (22.55cm) plant canopy north to south (17.44cm³), plant canopy east to west (20.38cm³), number of sprouting (6.33), new shoots height (59.11), and Survival

percentage (100%) was recorded in treatment T₄ (NPK(50% RDF)+50% vermicompost).

The maximum plant height was recorded in T₄ (NPK50% RDF+50% vermicompost) with (47.78cm), followed by T₃ (NPK 50% RDF+50% poultry manure) with (47.11cm) and the minimum was recorded in T₀ (control) with (34.66cm).

The maximum plant circumference were recorded in T₄ (% RDF+50% vermicompost) with (22.55), followed by T₃ (50% RDF+50% poultry manure) with (14.78) and the minimum was recorded in T₀ (control) with (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).

The maximum plant canopy east to west was recorded in T₄ (NPK50% RDF+50% vermicompost) with (20.38), followed by T₃ (50% RDF+50% poultry manure) with (17.22) and the minimum was recorded in T₀ (control) with (8.44).

The maximum number of sprouting per plant was recorded in T₄ (NPK50% RDF+50% vermicompost) with (6.33), followed by T₃ (50% RDF+50% poultry manure) with (5.00) and the minimum was recorded in T₀ (control) with (3.05).

The maximum Survival % was recorded in T₄ (NPK50% RDF+50% vermicompost) with (100%), followed by T₃ (50% RDF+50% poultry manure) with (100%) and the minimum was recorded in T₀ (control) with (33.33).

Conclusion

On the basis of results obtained, It is concluded that the treatment T₄ (NPK (50% RDF)+50% vermicompost) was found beneficial in terms of maximum vegetative growth (47.78 cm).

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