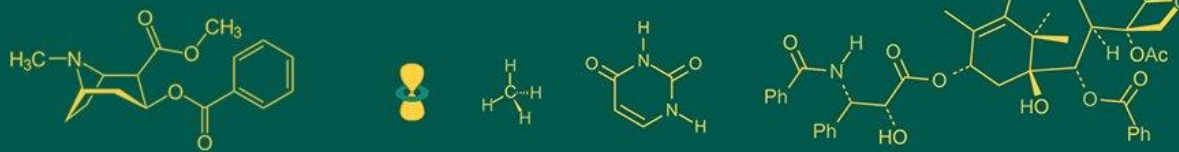


International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693
 ISSN Online: 2617-4707
 IJABR 2024; SP-8(8): 738-742
www.biochemjournal.com
 Received: 07-05-2024
 Accepted: 11-06-2024

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Effects of different planting time on their survival and growth parameter of different types of jackfruit at Prayagraj, Uttar Pradesh

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DOI: <https://doi.org/10.33545/26174693.2024.v8.i8Sk.1918>

Abstract

The present experiment was carried out at Horticulture Research Farm, Department of Horticulture, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences (SHUATS), Prayagraj, U.P, India, during the (2023-2024). A one and half year old Seedling and grafted jackfruit plants which is (approx. 65 no. of plants) The experiment was laid out in Factorial Randomized Block Design {FRBD} with 20 treatments and each was replicated thrice with 10 varieties viz., Singapore, Varashree y, redmoon, G 11, Wild jack, Kini Singapore, prashanthi, janagere, Sampoorana, shankara of jackfruit. Among the varieties, maximum plant height (87.94), number of branches per plant (6.48), number of leaves per plant (62.93), leaf area (68.87 cm²), leaf width (7.30 cm), leaf length (12.98 cm), survival percentage (100.00), mortality percentage (0.00) and chlorophyll content (SPAD) (62.40) were recorded in Varashree y. Transplanting of jackfruit days after transplanting recorded significantly higher plant height (61.95 cm), number of branches per plant (4.73), number of leaves per plant (47.91), leaf area (cm) (50.22), leaf width (cm) (5.68), leaf length (cm) (10.34), survival percentage (66.67), mortality percentage (33.32), chlorophyll content (SPAD) (51.04) over other dates of planting. Among the treatment combinations V₂: Varashree y emerged as the best combination with regard to vegetative growth and survival percentage of jackfruit.

Keywords: Variteis, planting time, growth parameter, survival, mortality percentage and jackfruit

Introduction

Jackfruit (*Artocarpus heterophyllus*) belongs to the family Moraceae. The word jackfruit is derived from the Portuguese word jaca, which is further derived from the Malayalam word chakka. Jackfruit trees produce both female and male flowers, hence making them monoecious. In several Asian nations, the jackfruit is a well-known fruit. Although jackfruit seeds are underutilized and less well known, they have significant nutritional advantages and could be used as a functional food ingredient.

The edible section is the fleshy carpel, also known as the perianth in botanical terms. The evergreen, latex-producing jackfruit tree may grow to heights of up to 80 feet, with a straight stem that forks around the base. The tree develops a lengthy taproot. All pieces are made of milky white, extremely sticky latex (Ken Love and Paull, 2011)^[6]. The blooms of the jackfruit grow on short shoots on the trunk and older branches. The thick, rubbery peel is covered with small, blunt spines, and the fruit can contain up to 500 seeds. The average fruit weight is around 35 pounds, although they are sometimes much greater. A 144-pound jackfruit was exhibited in 2010 at a jackfruit festival in Kerala, India. The largest Hawaiian fruit weighed 79 pounds and was included in the Guinness Book of World Records for several years. Only the rind and core are inedible, non-areas where the fruit is consumed (Ken love and Paull, 2011)^[6].

My present research of jackfruit varieties are Singapore

Singapore (or) Ceylon Jack: The fruit, introduced from Sri Lanka, is medium-sized, weighing 7-10 kg, with crisp, sweet, yellow carpels. It is a precocious bearer, starting bearing 3 years after planting, available from March-June and September-December.

Varashree

Varashree Jack is developed in Karnataka. This is one of the best variety of jackfruit available in the market. The fruit has a very pleasant taste. It is crispy and very sweet. The fruits are medium in size and yields in May-Jun.

Redmoon

It is a rich source of vitamin 'A', 'C' and minerals. Origin: Western Ghats of India and common in Asia, Africa, and some regions in South America Distribution : Burma, Ceylon, Southern China, Malaya, and the East Indies, Philippines. Bark rough to somewhat scaly, dark grey to greyish-brown. Crown dense, conical in young and shaded trees, becoming rounded or spreading in the older tree. New shoots, twigs, and leaves are usually glabrous but occasionally short-haired and scabrid. The ripe fruit is sweet (depending on variety) and is more often used for desserts. Canned green jackfruit has a mild taste and meat-like texture that lends itself to being called a "vegetable meat".

G 11

G-11 jack is a variety developed by Indian Council of Agricultural Research (ICAR). It is now widely available across India. The fruit of this tree is orange in colour and sweet to taste. This tree yields fruits in May-Jun.

Wild jack

Artocarpus hirsutus, commonly known as wild jack, is a tropical evergreen tree species that is native to India, primarily in Kerala, but also in Karnataka, Maharashtra and Tamil Nadu, where it grows in moist, deciduous to partially evergreen woodlands.

Kini Singapore

Singapore jack is a jackfruit native to Singapore. The bearing time of this tree is usually 2 years. The fruits are generally big in size. It has pleasant sweet taste. The yielding season is May-Jun

Prashanthi

The 'Prashanti' variety of jackfruit grown by Gabriel Stany Veigas, a retired district forest officer, at Neerakere in Tenka Mijar village near Moodbidri.

Janagere

Janagere and NSP were ellipsoid fruits have been identified for commercial purposes. RAPD markers to estimate the genetic diversity of twelve high-yielding jackfruit. The genetic dissimilarity matrix was computed using Squared Euclidian Distances, revealing a minimum genetic distance of 5% between the genotypes ('M0') and 'Kerala', indicating their similar geographical origin, and a maximum genetic distance of 7.9% between a clone of 'Mottavarica' ('M0') and 'Chandrahala' from distant locations.

Shankara

It is a selection from a 25 year old tree at farmers' field of Shri Shankariah, Chowdlapura village, in Tumkur District of Karnataka. Growth habit is medium tall tree with semi spreading nature and fairly large dark green leaves. It bears solitary fruits on the primary as well as secondary branches. Female flowers are larger than the male and pedicel is thick one. It bears fruits in bunches on the primary branches and also on secondary branches. Fruit is a multiple type with

small size fruits (2-5 kg), fruit's skin colour is dark green when mature and tip of spine becomes brownish to black when ripe. The average fruit weight is 2.73 kg and contains 61.40 number of flakes with average flake weight of 17.95 g; flake shape is irregular and thickness is 5.86 mm. The fruit contains the edible, sweet, aromatic, medium crispy bulbs and coppery red coloured flakes. The crop is generally harvested during April-June. Well-managed tree is estimated to yield around 460.12 kg per fruit tree.

Materials and Methods

An experiment laid out in Factorial Randomized Block Design {FRBD} with 20 treatments and each was replicated thrice. The experiments were constituted on different date planting with different 10 varieties viz., Singapore, Varashree y, redmoon, G 11, Wild jack, Kini Singapore, prashanthi, janagere, Sampoorna, shankara of jackfruit. At Research Farm, Department of Horticulture, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences (SHUATS), Prayagraj, U.P., India during the (2023-2024).

Details of treatment**Factor A: Date of Transplanting**

D₁: 18th August 2023

D₂: 10th November 2023

Factor B: Varieties

V₁: Singapore

V₂: Varashree y

V₃: Redmoon

V₄: G 11

V₅: Wild jack

V₆: Kini Singapore

V₇: Prashanthi

V₈: Janagere

V₉: Sampoorna

V₁₀: Shankara

Treatment Details

Table 1: Planting of 10 different varieties of jackfruit in different planting time

Treatment symbol	Variety	Treatment combination
T ₁	Singapore	18 August
T ₂	Singapore	10 November
T ₃	Varashree y	18 August
T ₄	Varashree y	10 November
T ₅	Redmoon	18 August
T ₆	Redmoon	10 November
T ₇	G 11	18 August
T ₈	G 11	10 November
T ₉	Wild jack	18 August
T ₁₀	Wild jack	10 November
T ₁₁	Kini singapore	18 August
T ₁₂	Kini singapore	10 November
T ₁₃	Prashanthi	18 August
T ₁₄	Prashanthi	10 November
T ₁₅	Janagere	18 August
T ₁₆	Janagere	10 November
T ₁₇	Sampoorna	18 August
T ₁₈	Sampoorna	10 November
T ₁₉	Shankara	18 August
T ₂₀	Shankara	10 November

Statistical Analysis

Data were subjected to analysis of variance (ANOVA) using OPISTAT Software version 9.3.

Results and Discussion

The result of the experiment entitled Influence of different planting time on their survival and growth parameter of different types of jackfruit is presented here in the chapter. To have better clarity, the results have been presented through tables and graphs. Further, graphical presentation of the data has also been made to really visualize the effect of various treatments of the experiment. Vegetative growth parameters were Plant height (cm), Number of branches per plant, Number of leaves per plant, Leaf area (cm), Leaf width (cm), Leaf length (cm), Survival percentage, Mortality percentage, Chlorophyll content (SPAD value)

Here, the calculations is done in between of different planting time and varieties viz., Singapore, Varashree y, redmoon, G 11, Wild jack, Kini Singapore, prashanthi, janagere, Sampoorana, shankara of jackfruit, and its Vegetative growth parameters were Plant height (cm), Number of branches per plant, Number of leaves per plant, Leaf area (cm), Leaf width (cm), Leaf length (cm), Survival percentage, Mortality percentage, Chlorophyll content (SPAD value)

As far as interaction between different varieties and planting time is concerned; the maximum plant height at 30, 60 and 90 (89.40, 93.90 and 99.70) was obtained with V₂: Varashree y + 18th August 2023. Where s the the minimum plant height at 30, 60 and 90 (42.00, 42.00 and 0.00) was found in treatment V₄: G 11 + 18th August 2023 and V₄: G 11+10th November 2023.

As far as interaction between different varieties and planting time is concerned; the maximum number of branches per plant at 30, 60 and 90 (4.69, 5.27 and 6.80) was obtained with V₂: Varashree y + 18th August 2023. Where s the the minimum number of branches per plant at 30, 60 and 90 (1.19, 1.20 and 0.00) was found in treatment V₄: G 11 + 18th August 2023 and V₄: G 11+10th November 2023.

As far as interaction between different varieties and planting time is concerned; the maximum number of leaves per plant at 30, 60 and 90 (35.47, 49.99 and 65.62) was obtained with V₂: Varashree y + 18th August 2023. Where s the the minimum number of leaves per plant at 30, 60 and 90 (6.66, 6.66 and 0.00) was found in treatment V₄: G 11 + 18th August 2023 and V₄: G 11+10th November 2023.

As far as interaction between different varieties and planting time is concerned; the maximum leaf area (cm) (70.27) was obtained with V₂: Varashree y + 18th August 2023. Where s the the minimum leaf area (cm) (0.00) was found in treatment V₄: G 11 + 18th August 2023 and V₄: G 11+10th November 2023.

As far as interaction between different varieties and planting time is concerned; the maximum leaf width (cm) (7.43) was obtained with V₂: Varashree y + 18th August 2023. Where s the the minimum leaf width (cm) (0.00) was found in treatment V₄: G 11 + 18th August 2023 and V₄: G 11+10th November 2023.

As far as interaction between different varieties and planting time is concerned; the maximum leaf length (cm) (13.53) was obtained with V₂: Varashree y + 18th August 2023. Where s the the minimum leaf length (cm) (0.00) was found in treatment V₄: G 11 + 18th August 2023 and V₄: G 11+10th November 2023.

As far as interaction between different varieties and planting time is concerned; the maximum survival percentage (100.00) was obtained with V₂: Varashree y+ 18th August 2023. Where s the the minimum survival percentage (0.00) was found in treatment V₄: G 11 + 18th August 2023 and V₄: G 11+10th November 2023

As far as interaction between different varieties and planting time is concerned; the minimum mortality percentage (0.00) was obtained with V₂: Varashree y+ 18th August 2023 and 10th November 2023. Where s the the maximum mortality percentage (100.00) was found in treatment V₄: G 11 + 18th August 2023 and V₄: G 11+10th November 2023.

As far as interaction between different varieties and planting time is concerned; the maximum chlorophyll content (SPAD) (63.41) was obtained with V₂: Varashree y+ 18th August 2023. Where s the the minimum chlorophyll content (SPAD) (0.00) was found in treatment V₄: G 11 + 18th August 2023 and V₄: G 11+10th November 2023.

The Varashree Y variety of jackfruit is performing good in above all aspects in Prayagraj (Uttar Pradesh) that I concluded due to the following reasons

Pest and Disease Resistance: This variety could have been developed to be more resistant to common pests and diseases, reducing the need for chemical interventions and improving the overall health of the tree.

Climate Adaptability: Varashree Y might be more adaptable to varying climatic conditions, making it a good choice for regions with fluctuating weather patterns, specially for Prayagraj conditions.

Shorter Maturity Period: If this variety matures faster, it allows for quicker harvesting and can lead to multiple cropping cycles in a year.

Tree Health and Longevity of Varashree Y is for its robust tree health and longer productive lifespan, ensuring consistent fruit production over many years.

Table 2: Growth parameters

Symbols	Variety names	Plant height (90DAT)	Number of branches 90 DAT	Number of leaves per plant	Leaf area (cm ²)	Leaf width (cm)
T ₁	V ₁ : Singapore	54.69	5.35	43.32	56.17	6.33
T ₂	V ₂ : Varashree y	87.94	6.48	62.93	68.87	7.30
T ₃	V ₃ : Redmoon	70.72	5.04	51.03	53.35	6.01
T ₄	V ₄ : G 11	0.00	0.00	0.00	0.00	0.00
T ₅	V ₅ : Wild jack	50.20	3.99	46.95	48.12	6.20
T ₆	V ₆ : Kini singapore	55.59	4.69	48.93	49.76	5.83
T ₇	V ₇ : Prashanthi	51.09	4.38	49.57	53.75	5.62
T ₈	V ₈ : Janagere	66.17	4.64	47.09	59.41	6.00
T ₉	V ₉ : Sampoorna	71.60	4.62	48.33	46.12	5.63
T ₁₀	V ₁₀ : Shankara	79.69	4.74	46.96	56.92	5.94
	F-Test	C.D. at 0.5%	C.D. at 0.5%	C.D. at 0.5%	C.D. at 0.5%	C.D. at 0.5%
	S.Ed.	0.46	0.24	0.42	2.25	0.27
	CD at 0.5%	0.21	0.11	0.19	1.01	0.12
	CV	0.66	0.34	0.59	N/A	N/A

Table 3: Growth parameters

Symbols	Variety names	Leaf length (cm)	Survival percentage	Mortality percentage	Chlorophyll content (SPAD)
T ₁	V ₁ : Singapore	10.33	72.22	27.78	58.51
T ₂	V ₂ : Varashree y	12.98	100.00	0.00	62.40
T ₃	V ₃ : Redmoon	11.42	61.11	38.89	54.71
T ₄	V ₄ : G 11	0.00	0.00	100.00	0.00
T ₅	V ₅ : Wild jack	11.02	66.67	33.33	55.18
T ₆	V ₆ : Kini singapore	9.87	72.22	27.78	57.20
T ₇	V ₇ : Prashanthi	10.72	72.22	27.78	52.84
T ₈	V ₈ : Janagere	10.49	66.67	33.33	52.43
T ₉	V ₉ : Sampoorna	10.92	72.22	27.78	54.62
T ₁₀	V ₁₀ : Shankara	11.85	66.67	33.19	55.30
	F-Test	C.D. at 0.5%	C.D. at 0.5%	C.D. at 0.5%	C.D. at 0.5%
	S.Ed.	0.49	17.14	17.14	2.27
	CD at 0.5%	0.22	N/A	N/A	1.02
	CV	0.69	N/A	N/A	N/A

Conclusion

From the study, it may be concluded that under Prayagraj agro climatic conditions of Uttar Pradesh, higher vegetative growth and survival percentage of Jackfruit can be obtained by transplanting time the jackfruit during 18th August 2023 with V₂:Varashree y compared to rest of the combinations.

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