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Study the Effect of Potting Media on Germination and Seedling Growth of Jackfruit

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Abstract

An investigation was conducted at Forest Nursery and Research Centre, College of Forestry, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj during the years 2023 and 2024. Completely Randomized design (CRD) was employed with 10 treatments and three (3) replication each. The perforated polythene bags of 8 x 10 cm size were used for sowing. As per growing media treatment combinations, different mixtures of Soil, Sand, FYM, Poultry manaure and vermicompost were prepared and filled in polyethylene bags. The polyethylene bags of different growing media combinations were kept in green house. The seeds of (*Artocarpus heterophyllus* Lam.) were sown in 2.5 cm depth in polybags prepared with different potting mixture on July, 2023 and July 2024. From the research investigation it is found that treatment T9: Soil: Sand: Vermicompost (1:1:2). was found best in the terms of germinations (%), seedling height (cm), root length (cm), collar diameter (mm), number of leaves seedling, leaf area (cm^2), fresh weight of shoot (g), dry weight of shoot (g), fresh weight of root (g), dry weight of root (g), root shoot : ratio, fresh weight of plant (biomass yield), dry weight of plant (biomass yield), seed vigour index (i) and seed vigour index (ii).

Keywords: Potting media; germination; seedling growth and jackfruit.

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1. Introduction

Jackfruit (*Artocarpus heterophyllus* Lam.) is a member of the Moraceae family and has a chromosome count of 56. It is recognized as the largest edible fruit globally (Naik, 1949 and Sturrock, 1959). The term Artocarpus originates from the Greek words artos (meaning bread) and carpos (meaning fruit). The name 'Jackfruit' comes from the Portuguese word jaca, which in turn is derived from the Malayalam word chakka. This enormous fruit is known by various names including kathal, panasa, jaca, nangka, kanoon, mit, or its scientific name *Artocarpus heterophyllus*. As a cross-pollinated species, jackfruit exhibits high heterozygosity and is seedling-origin. For the successful establishment of commercial orchards, clonal propagation of jackfruit is crucial to inherit the desirable characteristics of the maternal parent, as stated by Aseef et al. (2018). It is regarded as a native species of the rainforests in the Western Ghats of India and Malaysia. Jackfruit is extensively cultivated both commercially and in home gardens. The leading producers of jackfruit include Bangladesh, India, Myanmar, Indonesia, Sri Lanka, and Malaysia. It is also cultivated in Brazil and certain regions of the West Indies. In India, jackfruit is predominantly grown in Kerala, Karnataka, Tamil Nadu, Andhra Pradesh, West Bengal, Maharashtra, and Assam. This fruit enjoys significant popularity in the Eastern and Southern regions of India. In Northern India, it thrives along the foothills of the Himalayas, while in Southern India, it can be found at altitudes of up to 2400 meters. Wild jackfruit is commonly seen in the Western Ghats of India and is a frequent sight around homes in Kerala, where it is often utilized as a shade tree in coffee plantations. Nevertheless, the largest area dedicated to jackfruit cultivation in India is located in Assam. By the 2021-22 period, jackfruit was cultivated over 1.95 lakh hectares in India, with an estimated production of 33.01 lakh metric tonnes (Agricoop, 2021-22, Choudhary et al. 2025, Anonymous, 2018).

There are various types of media that consist of fine sand blended in different ratios with materials like soil, coir pith, peat moss, sawdust, rice hull, and others. In contemporary practices, vermicompost and cocopeat are also incorporated into diverse media mixtures. Nonetheless, it is essential to standardize the ratios of these components to ensure the production of healthy and robust rootstock, which is crucial for softwood grafting in jackfruit. Typically, a mixture of soil and farmyard manure (FYM) is utilized as a potting medium for seedling production as rootstock. This process requires a significant amount of expensive soil sourced from arable land, which can adversely impact agriculture in the area. In light of this, there is an urgent need to explore alternatives to replace soil with more readily available components for growing media, as noted by Gawankar et al. (2021). Soil, sand, and farmyard manure are traditionally used as media, both individually and in combination. The inclusion of farmyard manure enhances soil structure, fertility, and often mitigates nutrient deficiencies. However, traditional media do not yield higher outputs, while the most cost-effective method for seedling production remains the traditional media comprising soil, sand, and farmyard manure in a 1:1:1 ratio (Chaudhary et al., 2024). Vermicomposting is defined as the 'bioxidation and stabilization of organic material through the collaborative efforts of earthworms and mesophilic microorganisms.' Under suitable conditions, earthworms consume agricultural waste, reducing its volume by 40 to 60%. Vermicompost generated by earthworm activity is abundant in macro and micro nutrients, vitamins, growth hormones, and enzymes such as proteases, amylases, lipase, cellulase, and chitinase, along with immobilized microflora. Reduced use of water for irrigation, reduced pest attack, reduced termite attack, reduced weed growth; faster rate of seed germination and rapid seedlings growth and development; greater numbers of fruits per plant and greater numbers of seeds per year are only some of the beneficial effects of the vermi-compost usage in agricultural production Pradhan et al., (2025).

2. Materials and Methods

An investigation was conducted at Forest Nursery and Research Centre, College of Forestry, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj during the years 2023 and 2024. The experimental site is situated between 25^0 42′ north latitude and 81^0 85′ east longitude with an altitude of 98meter amsl. It lies in the fifth agro climatic region of India (upper gangetic plains) adjacent to the river Ganga and Yamuna. The climate of the area is generally tropical, characterized by hot summer with maximum temperature of 48^0 C during May-June and cold winter with minimum temperature of 1^0C. The average annual rainfall lies between 850 mm to 1000 mm, most of which is concentrated during monsoon season. Completely Randomized design (CRD) was employed with 10 treatments and three (3) replication each. The perforated polythene bags of 8 x 10 cm size were used for sowing. As per growing media treatment combinations, different mixtures of Soil, Sand, FYM, Poultry manaure and vermicompost of ratio 1:1:1, 1:2:1, and 1:1:2 were prepared and filled in polyethylene bags. After filling the bags, light irrigation was done. The polyethylene bags of different growing media combinations were kept in green house. The treatment details are: T0: Soil (Control), T1: Soil: Sand:

FYM (1:1::1), T2: Soil:Sand:Poultry Manure (1:1:1), T3: Soil : Sand: Vermicompost (1:1:1), T4: Soil: Sand: FYM :1:2:1), T5: Soil: Sand: Poultry Manure (1:2:1), T6: Soil: Sand : Vermicompost (1:2:1), T7: Soil: Sand : FYM (1:1:2) , T8: Soil : Sand: Poultry Manure (1:1:2) and T9: Soil : Sand: Vermicompost (1:1:2). The seeds were extracted, washed with clean water and dried in shade for a day. The soaking of seeds carried out for 24 hours in clean water before sowing. After keeping the bags in different growing conditions seeds were sown in the bags. The seeds of (*Artocarpus heterophyllus* Lam.) were sown in 2.5 cm depth in polybags prepared with different potting mixture on July, 2023 and July 2024. Germination percentage were calculated by dividing the total number of germinated seeds by the total number of seeds sown and multiplied by 100. Observations on seedling growth of three seedlings randomly selected in each treatment were recorded seedling height (cm) at 120 DAS, root length (cm) at 120 DAS, collar diameter (mm) at 120 DAS, number of leaves seedling at 120 DAS, leaf area (cm^2) at 120 DAS, fresh weight of shoot (g), dry weight of shoot (g), fresh weight of root (g), dry weight of root (g), root shoot : ratio, fresh weight of plant (biomass yield), dry weight of plant (biomass yield), seed vigour index (I) and seed vigour index (II). The data in the present investigation was statistically analyzed by the method suggested by Panse and Sukhatme (1985).

3. Results and Discussion

The data presented in Table 1 showed the effect of different potting media on the germinations (%), seedling height (cm) at 120 DAS, root length (cm) at 120 DAS, collar diameter (mm) at 120 DAS, number of leaves seedling at 120 DAS and leaf area (cm^2) at 120 DAS of jackfruit seeds during 2023 and 2024 as well as the pooled data under greenhouse conditions in Prayagraj agro-climactic condition. Potting media showed significant effect on seed germination percentage during the years 2023 and 2024 as well as pooled data. The highest germination percentage of jackfruit seed (96.35, 98.44 and 97.40%) was recorded under treatment T9: Soil : Sand: vermicompost (1:1:2). Whereas the minimum germination percentage (32.81, 31.77 and 32.29) was found in treatment T_0 Soil (Control) in the year 2023, 2024 and pooled data respectively. The seeds of jackfruit are germinated using vermicompost, FYM, and cocopeat, which enhance cell wall plasticity and improve water absorption. This process leads to an increase in metabolic activity and a rise in respiration rates. Oxygen is utilized, and carbon dioxide is emitted as the embryo transforms stored energy into usable forms, culminating in the emergence of the radicle, the embryonic root. The radicle grows downward into the soil, securing the developing plant and facilitating the absorption of water and nutrients from the soil. Following this, cotyledon expansion occurs, resulting in the production of true leaves that assist in photosynthesis (Panchal et al., 2014). The root system and shoot are established, and maturation ensues. With adequate growth and development, the seedling evolves into a mature plant capable of reproduction. Environmental factors such as temperature, light, and soil conditions are critical in regulating germination (Jyoti and Beniwal, 2016). Potting media showed significantly effect on seedling height (cm), root length (cm), collar diameter (mm), number of leaves per seedling, leaf area (cm^2) at 120 DAS during the years 2023 and 2024 as well as pooled data. It is observed from the table that treatment T_9: Soil : Sand: Vermicompost (1:1:2) resulted in the maximum seedling height (38.51, 37.34 and 37.93cm), root length (19.06, 14.33 and 16.70 cm), collar diameter (mm) (10.09, 10.18 and 10.14), number of leaves per seedling (17.53, 17.43 and 17.48), leaf area (75.51, 76.14 and 75.83 cm^2) in the year 2023, 2024 and their pooled data. Whereas the minimum seedling height (6.25, 6.44 and 6.35 cm), root length (19.06, 14.33 and 16.70), collar diameter (mm) (10.09, 10.18 and 10.14), number of leaves per seedling (17.53, 17.43 and 17.48), leaf area (cm^2) (75.51, 76.14 and 75.83) was found in treatment T_0 Soil (Control) in the year 2023, 2024 and pooled data respectively. The increase in the height of jackfruit seedlings may be attributed to the effects of balanced nutrition and enhanced soil physico-chemical properties resulting from the combination of all four organic amendments. This mixture improved nutrient availability, aeration, water retention capacity, and fungal/microbial activity in the soil more effectively than individual or paired amendments. Similar findings were reported by Prajapati et al. (2017) in acid lime, Parmar et al. (2019) in custard apple, and Lad et al. (2020) in mango. This could explain the enhanced germination and vigor characteristics, particularly reflected in root length. The maximum root length recorded in treatment T_9 was due to the most favorable conditions for root system expansion in jackfruit seedlings. By evenly supplying nutrients and enhancing soil conditions with the balanced mixture of Soil: Sand: Vermicompost, robust root elongation was facilitated. The current results align closely with the findings of Meena et al. (2017) in papaya, Prajapati et al. (2017) in acid lime, in papaya. The increase in the number of leaves per jackfruit seedling may be influenced by soil moisture, ambient temperature, and the nutrition provided by the growth media, which can affect leaf count. Nutrients play a crucial role in facilitating various metabolic activities and maintaining hormonal balance within the plant. The observed variation in the number of leaves among seedlings grown in different media is likely due to the distinct physical and chemical properties of those media. This investigation is further supported by the work of Parasana et al. (2013) in mango, Parmar et al. (2019) in custard apple, and Nainar et al. (2021) in acid lime.

The data presented in Table 2 showed the effect of different potting media on the fresh weight of shoot (g), dry weight of shoot (g), fresh weight of root (g), dry weight of root (g) and root shoot: ratio of jackfruit seeds during 2023 and 2024 as well as the pooled data under greenhouse conditions. Potting media showed significant effect on fresh weight of shoot (g), dry weight of shoot (g), fresh weight of root (g), dry weight of root (g) and root shoot: ratio during the years 2023 and 2024 as well as pooled data. The highest fresh and dry weight of shoot (g) (9.72, 9.65 and 9.69 and 2.82, 2.80 and 2.81) was recorded under treatment T_9: Soil: Sand: Vermicompost (1:1:2). Whereas the minimum fresh and dry weight of shoot (5.55, 5.50 and 5.53 and 0.97, 0.96 and 0.97) was found in treatment T_0 Soil (Control) in the year 2023, 2024 and pooled data respectively. The present result has been supported by the findings of Bhardwaj (2013), Sajana et al. (2018) and Dayal et al., (2025). The highest fresh and dry weight of root (g) of jackfruit seed (3.71, 3.80 and 3.75 and 1.13, 1.15 and 1.14) was recorded under treatment T_9: Soil: Sand: Vermicompost (1:1:2). Whereas the minimum fresh and dry weight of root (2.18, 2.17 and 2.18 and 0.44, 0.44 and 0.44) was found in treatment T_0 Soil (Control) the year 2023, 2024 and pooled data respectively. The increase in the fresh weight of jackfruit seedling roots may be attributed to the balanced mixture of Soil, Sand, and Vermicompost, which created optimal conditions for vigorous root growth and maximum fresh weight. A similar outcome was reported by Hota et al. (2018) in Jamun. The combination of vermicompost, rice husk, and coco-peat (T6) provided a uniform supply of nutrients and enhanced soil properties, thereby promoting robust root development. Comparable results were noted by Meena et al. (2017) in papaya, Patel et al. (2017) in acid lime, and Lad et al. (2020) in mango. The increase in the dry weight of jackfruit seedling roots may be due to the diverse substrate of Soil, Sand, and Vermicompost, which offered optimal nutrition and structure for strong root growth and maximum dry weight accumulation. This diverse substrate was found to be superior for root development and dry matter accumulation, optimizing conditions to achieve the highest dry root weight in jackfruit seedlings. The current findings are corroborated by the research of Patel et al. (2017) in custard apple, Hota et al. (2018) in jamun, and Sahu et al. (2022) in papaya. Among the treatments, the control (T_0: Soil (Control)) recorded the highest and most stable root:shoot ratio (0.45) across both years and in the pooled data. In contrast, the treatment containing Soil: Sand: Vermicompost in 1:1:2 proportion (T_9) resulted in a slightly lower root:shoot ratio, with values of 0.40 in 2023, 0.41 in 2024, and a pooled mean of 0.41. Overall, the findings indicate that while T_0 promoted relatively higher allocation of biomass to roots compared to shoots, the incorporation of vermicompost in T_9 slightly shifted biomass allocation toward shoot development, resulting in a marginally reduced root:shoot ratio.

The data presented in Table 3 showed the effect of different potting media on the fresh and dry weight of plant (g) of jackfruit seeds during 2023 and 2024 as well as the pooled data under greenhouse conditions. Potting media showed significantly effect on fresh and dry weight of plant (g) during the years 2023 and 2024 as well as pooled data. The highest fresh weight of plant (g) of jackfruit seed (61.50, 60.84 and 61.17 and 19.77, 19.56 and 19.67) was recorded under treatment T_9: Soil: Sand: Vermicompost (1:1:2). Wheras the minimum fresh weight of plant (g) (29.12, 29.67 and 29.40 and 7.17, 7.31 and 7.24) was found in treatment T_0 Soil (Control) the year 2023, 2024 and pooled data respectively. The data presented in Table 3 showed the effect of different potting media on the seed vigour index (I and II) of jackfruit seeds during 2023 and 2024 as well as the pooled data under greenhouse conditions. Potting media showed significantly effect on seed vigour index (I and II) during the years 2023 and 2024 as well as pooled data. The highest seed vigour index (I and II) of jackfruit seed (3710.21, 3675.98 and 3693.10 and 19.05, 19.25 and 19.15) was recorded under treatment T_9: Soil: Sand: Vermicompost (1:1:2). Whereas the minimum seed vigour index (I and II) (763.01, 724.65 and 743.83 and 2.35, 2.32 and 2.34) was found in treatment T_0 Soil (Control) the year 2023, 2024 and pooled data respectively. This led to an enhanced synthesis of metabolites and an increase in cell division, resulting in a higher fresh weight of seedlings. Furthermore, the treatment involving Soil: Sand: Vermicompost contributed organic matter and essential nutrients to the soil, while also enhancing its structure and aeration. This established ideal conditions for root growth and the absorption of water and nutrients. The findings of this study are corroborated by the research conducted by Malakar et al. (2019) on acid lime, Singh et al. (2020) on papaya, Nainar et al. (2021) on acid lime, and Jyoti et al. (2022) on jackfruit. The observed increase in the dry weight of jackfruit seedlings in treatment T6 can be attributed to the optimal nutritional and soil conditions provided by Soil: Sand: Vermicompost, which fostered vigorous plant growth and a greater accumulation of dry matter. This, in turn, facilitated improved photosynthesis and metabolism, promoting cellular division and expansion, thereby increasing the dry weight of seedlings. The current results align with the findings of Patel et al. (2017) on custard apple, Prajapati et al. (2017) and Nainar et al. (2021) on acid lime, as well as Salamat et al. (2021) on jackfruit.

Table 1. Study the effect of potting media on germination and seedling growth of jackfruit under agroclimatic condition of Prayagraj

Treatments Notation	Germinations (%)			Seedling height (cm) at 120 DAS			Root length (cm) at 120 DAS			Collar diameter (mm) at 120 DAS			Number of leaves Seedling at 120 DAS			Leaf area (cm^2) at 120 DAS		
	2023	2024	Pooled	2023	2024	Pooled	2023	2024	Pooled	2023	2024	Pooled	2023	2024	Pooled	2023	2024	Pooled
T0	32.81	31.77	32.29	23.29	22.81	23.05	9.58	7.83	8.70	6.58	6.71	6.64	8.44	8.41	8.43	42.54	42.72	42.63
T1	76.04	75.52	75.78	27.35	28.70	28.02	17.41	13.16	15.29	9.20	9.10	9.15	11.03	11.07	11.05	51.80	52.16	51.98
T2	72.40	71.88	72.14	33.64	34.07	33.86	18.10	13.66	15.88	9.61	9.58	9.60	15.07	14.98	15.03	58.68	58.96	58.82
T3	82.29	84.90	83.59	36.32	35.60	35.96	18.39	13.95	16.17	9.72	9.83	9.77	16.59	16.67	16.63	68.55	69.06	68.80
T4	64.06	65.10	64.58	35.02	34.90	34.96	16.78	12.39	14.58	8.58	8.63	8.61	11.44	11.38	11.41	53.24	53.49	53.36
T5	64.58	63.54	64.06	33.83	34.33	34.08	15.43	11.46	13.45	8.16	8.22	8.19	16.21	16.25	16.23	57.83	58.22	58.02
T6	88.54	93.23	90.89	37.36	37.47	37.41	18.87	14.22	16.55	9.91	9.84	9.87	17.03	17.11	17.07	73.26	73.82	73.54
T7	56.77	57.29	57.03	30.30	30.33	30.32	16.49	12.47	14.48	9.19	9.28	9.23	12.04	12.08	12.06	54.90	55.11	55.01
T8	60.94	52.60	56.77	27.95	28.67	28.31	17.03	12.68	14.85	9.13	9.27	9.20	14.43	14.53	14.48	57.61	58.05	57.83
T9	96.35	98.44	97.40	38.51	37.34	37.93	19.06	14.33	16.70	10.09	10.18	10.14	17.53	17.43	17.48	75.51	76.14	75.83
F-Test	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
C.D.at 0.5%	4.894	4.767	4.662	1.210	1.482	1.003	0.902	0.278	0.494	0.230	0.312	0.219	1.382	0.174	0.706	1.728	1.746	1.614
S.Em.	1.647	1.605	1.569	0.407	0.499	0.338	0.304	0.094	0.166	0.077	0.105	0.074	0.465	0.058	0.238	0.582	0.588	0.543
S.Ed. (±)	2.330	2.269	2.219	0.576	0.705	0.478	0.430	0.132	0.235	0.110	0.148	0.104	0.658	0.083	0.336	0.823	0.831	0.768
CV	4.107	4.003	3.914	2.180	2.665	1.806	3.148	1.285	1.964	1.489	2.020	1.419	5.763	0.723	2.944	1.684	1.682	1.564

Table 2. Study the effect of potting media on germination and seedling growth of jackfruit under agroclimatic condition of Prayagraj

Treatments Notation	Fresh weight of shoot (g)			Dry weight of shoot (g)			Fresh weight of Root (g)			Dry weight of Root (g)			Root shoot: Ratio		
	2023	2024	Pooled	2023	2024	Pooled	2023	2024	Pooled	2023	2024	Pooled	2023	2024	Pooled
T0	5.55	5.50	5.53	0.97	0.96	0.97	2.18	2.17	2.18	0.44	0.44	0.44	0.45	0.45	0.45
T1	8.18	8.06	8.12	2.16	2.13	2.15	3.13	3.11	3.12	0.73	0.72	0.72	0.34	0.34	0.34
T2	6.25	6.46	6.36	1.54	1.59	1.57	3.09	3.18	3.13	0.70	0.72	0.71	0.45	0.45	0.45
T3	9.17	9.35	9.26	2.54	2.59	2.57	3.61	3.57	3.59	1.04	1.03	1.04	0.41	0.40	0.40
T4	8.71	8.74	8.73	2.27	2.28	2.28	3.26	3.31	3.29	0.77	0.78	0.78	0.34	0.34	0.34
T5	6.74	6.40	6.57	1.49	1.42	1.46	2.86	2.87	2.87	0.65	0.66	0.65	0.44	0.46	0.45
T6	9.43	9.73	9.58	2.63	2.71	2.67	3.67	3.72	3.70	1.08	1.10	1.09	0.41	0.41	0.41
T7	7.69	7.60	7.64	1.95	1.93	1.94	3.24	3.29	3.27	0.77	0.79	0.78	0.40	0.41	0.40
T8	7.40	7.35	7.37	1.49	1.48	1.48	2.90	2.87	2.89	0.69	0.69	0.69	0.47	0.47	0.47
T9	9.72	9.65	9.69	2.82	2.80	2.81	3.71	3.80	3.75	1.13	1.15	1.14	0.40	0.41	0.41

Treatments	Fresh weight of shoot (g)			Dry weight of shoot (g)			Fresh weight of Root (g)			Dry weight of Root (g)			Root shoot: Ratio		
Notation	**2023**	**2024**	**Pooled**	**2023**	**2024**	**Pooled**	**2023**	**2024**	**Pooled**	**2023**	**2024**	**Pooled**	**2023**	**2024**	**Pooled**
F-Test	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
C.D.at 0.5%	0.409	0.296	0.237	0.105	0.075	0.061	0.111	0.102	0.067	0.029	0.025	0.018	0.026	0.022	0.017
S.Em.	0.138	0.100	0.080	0.035	0.025	0.021	0.037	0.034	0.022	0.010	0.008	0.006	0.009	0.007	0.006
S.Ed. (±)	0.195	0.141	0.113	0.050	0.036	0.029	0.053	0.049	0.032	0.014	0.012	0.008	0.012	0.010	0.008
CV	3.026	2.191	1.756	3.088	2.209	1.802	2.052	1.869	1.219	2.077	1.779	1.284	3.636	3.092	2.345

Table 3. Study the effect of potting media on germination and seedling growth of jackfruit under agroclimatic condition of Prayagraj

Treatments Notation	Fresh weight of plant (Biomass yield)			Dry weight of plant (Biomass yield)			Seed vigour index (I)			Seed vigour index (II)		
	2023	**2024**	**Pooled**	**2023**	**2024**	**Pooled**	**2023**	**2024**	**Pooled**	**2023**	**2024**	**Pooled**
T0	29.12	29.67	29.40	7.17	7.31	7.24	763.01	724.65	743.83	2.35	2.32	2.34
T1	55.58	55.20	55.39	15.29	15.19	15.24	2079.92	2167.78	2123.85	11.63	11.47	11.55
T2	47.56	47.97	47.76	14.32	14.45	14.39	2435.94	2448.92	2442.43	10.37	10.39	10.38
T3	58.31	57.69	58.00	17.62	17.43	17.53	2989.03	3023.01	3006.02	14.50	14.80	14.65
T4	55.14	55.80	55.47	15.79	15.97	15.88	2242.57	2274.43	2258.50	10.12	10.41	10.27
T5	46.50	48.15	47.33	14.26	14.76	14.51	2183.59	2181.23	2182.41	9.21	9.38	9.29
T6	59.93	59.29	59.61	18.89	18.69	18.79	3308.32	3494.11	3401.21	16.73	17.42	17.08
T7	56.74	56.54	56.64	16.77	16.71	16.74	1720.28	1738.02	1729.15	9.51	9.57	9.54
T8	50.36	51.02	50.69	15.64	15.84	15.74	1704.26	1506.64	1605.45	9.52	8.32	8.92
T9	61.50	60.84	61.17	19.77	19.56	19.67	3710.21	3675.98	3693.10	19.05	19.25	19.15
F-Test	S	S	S	S	S	S	S	S	S	S	S	S
C.D.at 0.5%	1.662	1.630	1.368	0.484	0.476	0.406	179.603	212.174	180.559	0.870	0.780	0.765
S.Em.	0.560	0.549	0.461	0.163	0.160	0.137	60.457	71.420	60.779	0.293	0.263	0.257
S.Ed. (±)	0.791	0.776	0.651	0.230	0.227	0.193	85.499	101.004	85.954	0.414	0.371	0.364
CV	1.861	1.820	1.530	1.813	1.781	1.519	4.526	5.324	4.540	4.489	4.013	3.940

4. Conclusion

It could be concluded that, T_9: Soil : Sand: Vermicompost (1:1:2) growing media had shown better results in seed germination and seedling growth parameters viz., germinations (%), seedling height (cm) at 120 DAS, root length (cm) at 120 DAS, collar diameter (mm) at 120 DAS, number of leaves Seedling at 120 DAS, leaf area (cm^2) at 120 DAS, fresh and dry weight of shoot (g), fresh and dry weight of Root (g), root shoot : Ratio, fresh and dry weight of plant (Biomass yield) and seed vigour index (I & II) of jackfruit seedling.

Competing Interests

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

Disclaimer (Artificial Intelligence)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

Competing Interests

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