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Effect of Potting Media on Seed Germination and Seedling of Jackfruit *(Artocarpus heterophyllus)*

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Jackfruit, (*Artocarpus heterophyllus*), evergreen tree (family Moraceae) native to tropical Asia and widely grown throughout the wetland tropics for its large fruits and durable wood. The greenish unripe fruit is cooked as a vegetable, and the brown ripened fruit is eaten fresh for the sweetly acid but insipid pulp surrounding the seeds. The seeds are cooked and eaten locally. Jackfruit is considered a staple food crop in Bangladesh and other areas in South and Southeast Asia. Canned or processed jackfruit has gained popularity as a meat substitute in some places.

The jackfruit tree is 15 to 20 metres (50 to 70 feet) tall at maturity and has large stiff glossy green leaves about 15 to 20 cm (6 to 8 inches) long. The small unisexual flowers are borne on dense inflorescences that emerge directly from the trunk and branches. Jackfruit is the largest tree-borne fruit in the world, reaching up to 60 cm (about 2 feet) long and weighing up to 18 kg (about 40 pounds). It is ellipsoidal and aggregate, composed of multiple "bulbs" of seed-containing flesh around a stringy core, all of which is enclosed by a bumpy rind.

Jackfruit offers plenty of calories – 155 calories in a one-cup serving. Around 92 percent of these calories come from carbs. The other eight percent is primarily protein – its three grams per cup outperforms the typical zero to one gram in apples and mangoes. There is also a small part of calories that comes from fat. These are the qualities, besides the texture of the flesh

Jackfruit also contains nearly every vitamin and mineral that is recommended for healthy diets. It contains about Calories 157, Fat 1.1g, Sodium 3.3g, Carbohydrate 38.3g, Fiber 2.5g, Sugar 32g, Protein 2.8g, Vitamin C 22.6mg, potassium 739mg.

Commercially softwood grafting technique is being followed for the production of jackfruit sapling in the Konkan region. As there is a huge demand for jackfruit grafts from the coastal region of Maharashtra, there is a need to enhance the production of healthy and vigorous jackfruit graft by standardizing growing media. Preparation of potting mixture plays an important role in the production of healthy rootstock for grafting. There are several types of media which include fine sand mixed in varying proportions with materials such as soil, coir pith, peat moss, sawdust, rice hull etc. Nowadays, vermicompost and cocopeat are also used in various media combinations. However, there is a need for standardizing the proportion of different components for the production of healthy and vigorous rootstock which is a prerequisite for softwood grafting in jackfruit.

Origin

Jackfruit (Artocarpus heterophyllus) is believed to have originated in the rainforests of the Western Ghats in southwestern India. The region includes the states of Kerala, Karnataka,

Goa, and Maharashtra. The jackfruit tree is well-suited to tropical lowlands and has been cultivated in this part of India for thousands of years. From its place of origin, jackfruit spread to other parts of India, Southeast Asia, and eventually to other tropical regions around the world. It has become a staple in the cuisines of many countries, playing a significant role in the culinary traditions and cultural practices of various communities.

The spread of jackfruit can be attributed to human cultivation and trade routes that facilitated the exchange of plants and seeds. Over time, different varieties of jackfruit have evolved in various regions, adapting to local climates and contributing to the diversity of this tropical fruit. Today, jackfruit is not only found in its native regions but has also been introduced and cultivated in tropical and subtropical areas worldwide, including parts of Africa, the Americas, and Australia. Its adaptability, nutritional value, and versatility in the kitchen have contributed to its popularity and widespread cultivation in diverse climates.

Botanical Description

1. **Tree Characteristics:**

- **Size:** Jackfruit trees are large and evergreen, capable of reaching heights of up to 30 meters (98 feet).
- **Growth Form:** The tree has a dense and spreading canopy with a typically straight trunk.
- **Leaves:** The leaves are alternate, glossy, leathery, and variable in shape. They are elliptical to oblong, with prominent midribs and secondary veins.

2. **Fruits:**

- **Size:** Jackfruit is the largest fruit that grows on a tree, with individual fruits weighing up to 80 pounds (36 kilograms).
- **Shape:** The fruit is oblong or ellipsoidal in shape, and it may be irregularly formed.
- **Surface Texture:** The exterior of the fruit is covered with spiky, green, hexagonal or pentagonal-shaped protuberances.

3. **Seeds:**

- **Size:** Jackfruit seeds are relatively large, about 2 to 4 centimeters in length.
- **Shape:** Seeds are generally flattened and ovoid.
- **Seed Coat:** The seed coat is smooth and hard.

4. **Bark:**

- **Color:** The bark of the jackfruit tree is smooth and grayish to brown in color.

5. **Latex:**

- **Latex Production:** The jackfruit tree produces a white, sticky latex when injured, which can be used for various purposes.

6. **Propagation:**

- **Propagation Methods:** Jackfruit trees can be propagated through seeds or vegetative means, such as grafting and budding.

Health Benefits

The nutritional profile of jackfruit contributes to its potential health benefits. Its high fiber content can aid digestion, and the presence of antioxidants, vitamins, and minerals supports overall well-being. In recent years, jackfruit has gained international attention as a sustainable and eco-friendly alternative to meat. Its meaty texture and ability to absorb flavors make it a popular choice in vegetarian and vegan recipes, providing a plant-based option for those seeking alternatives to animal products.

- **Different compost mixtures can have varying effects on the growth and development of jackfruit plants, depending on the composition and nutrient content of the compost. Here are some effects of different compost mixtures on jackfruit:**

1. **Nutrient Availability**: Compost mixtures rich in organic matter provide a balanced supply of essential nutrients, including nitrogen, phosphorus, potassium, and micronutrients. These nutrients are vital for the healthy growth of jackfruit plants, supporting root development, foliage growth, flowering, and fruiting. Different compost mixtures may have varying nutrient concentrations, influencing plant nutrient uptake and overall growth.
2. **Soil Structure and Texture**: Compost mixtures can improve soil structure and texture by enhancing soil aggregation, porosity, and water-holding capacity. Incorporating compost into the soil promotes better aeration and drainage, reducing soil compaction and waterlogging, which are beneficial for root growth and oxygen uptake in jackfruit plants.
3. **Water Retention and Moisture Management**: Compost mixtures with high organic matter content, such as well-decomposed plant residues and animal manure, help improve soil water retention and moisture management. Adequate soil moisture levels are essential for jackfruit growth, especially during periods of drought or water stress. Compost-amended soils can hold water more efficiently, reducing the frequency of irrigation and minimizing water loss through evaporation.
4. **pH Balance and Soil Fertility**: Some compost mixtures may influence soil pH levels, depending on the materials used in the composting process. Composts derived from alkaline materials, such as wood ash or limestone, may raise soil pH, while those derived from acidic materials, such as pine needles or coffee grounds, may lower soil pH. Maintaining the optimal pH range (slightly acidic to neutral) is crucial for jackfruit growth and nutrient availability.
5. **Microbial Activity and Soil Health**: Compost mixtures contain beneficial microorganisms, such as bacteria, fungi, and actinomycetes, which play essential roles in nutrient cycling, disease suppression, and soil fertility. These microbes help break down organic matter, release nutrients, and improve soil structure. Different compost mixtures may harbor diverse microbial communities, influencing soil health and the plant-microbe interactions beneficial for jackfruit growth.
6. **Disease and Pest Management**: Certain compost mixtures may exhibit suppressive effects against soilborne pathogens and pests, contributing to disease and pest management in jackfruit cultivation. Composts rich in lignin and cellulose, such as woody materials or leaf litter, can stimulate antagonistic microbial activity and enhance plant defense mechanisms, reducing the incidence of soilborne diseases and pest infestations.

In summary, selecting the appropriate compost mixture is essential for optimizing soil fertility, structure, and microbial activity, ultimately promoting healthy growth and productivity in jackfruit plants.



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