

# Technology of Cultivating Plumeria Rubra Ornamental Tree under the Climatic Conditions of Uzbekistan

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**Abstract:** This article analyzes the possibilities of cultivating ornamental trees of the *Plumeria* genus under the climatic conditions of Uzbekistan. Although the plant is naturally adapted to tropical and subtropical climates, it can be successfully cultivated in Uzbekistan with the implementation of specific agrotechnical measures. The study provides detailed information on propagation methods, care rules, irrigation and fertilization norms, and adaptation potential in different regions of the country.

**Keywords:** *Plumeria*, frangipani, ornamental plant, seedling propagation, agrotechnology, climate adaptation

## Introduction

Ornamental trees play a vital role in urban landscaping and landscape design. *Plumeria* is a genus widely spread in tropical and subtropical regions, distinguished by its fragrant flowers and decorative appearance. Native to Mexico, the Caribbean, and South Asia, *Plumeria* has recently attracted attention from researchers and gardeners in Uzbekistan due to its aesthetic and landscaping potential.

## Main Body

### 1. Climatic Conditions Analysis

*Plumeria* grows well at +20...+35 °C. Exposure to temperatures below 10 °C in winter can cause damage, making greenhouse protection crucial during the cold season. While the hot and dry summers of Uzbekistan are favorable, protective measures are essential in winter.



**Figure 1. *Plumeria* seedlings cultivated in a greenhouse in Uzbekistan.**

**Table 1. Main Botanical Characteristics of *Plumeria* Species**

Species	Flower Color	Growth Characteristics
<i>Plumeria rubra</i>	Red, pink	Fast-growing, large flowers
<i>Plumeria alba</i>	White	Moderate growth, fragrant flowers
<i>Plumeria obtusa</i>	White with yellow center	Evergreen foliage

### 2. Propagation Methods

*Plumeria* is mainly propagated by cuttings and seeds. Cuttings of 20–25 cm are taken, dried, and planted in sandy soil. Seed propagation is used for selection work. Rooting stimulants such as indole-3-butyric acid (IBA) or heteroauxin can accelerate root formation.

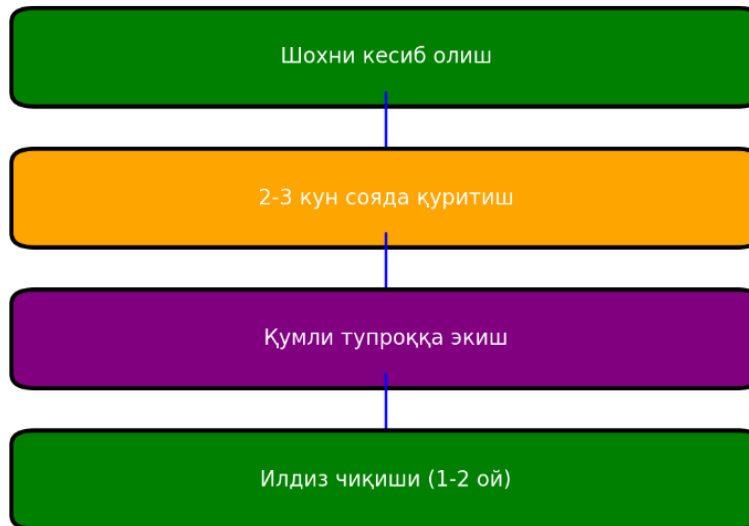


Figure 2. *Plumeria* seed propagation process

Table 2. Comparative Description of *Plumeria* Propagation Methods

Method	Advantages	Disadvantages
Cuttings	Fast and effective rooting	Difficult rooting in winter
Seeds	Suitable for selection	Slow growth; varietal characteristics may be lost
In vitro	Preserves rare varieties	Expensive and requires laboratory facilities

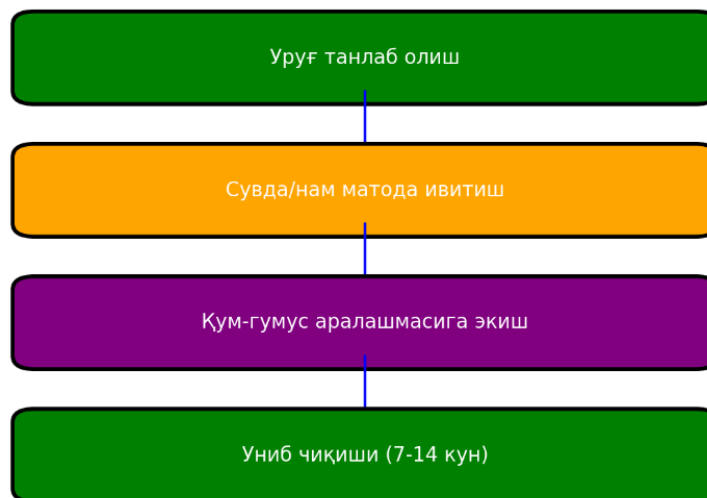


Figure 3. *Plumeria* seed propagation process.

### 3. Soil and Fertilizer Requirements

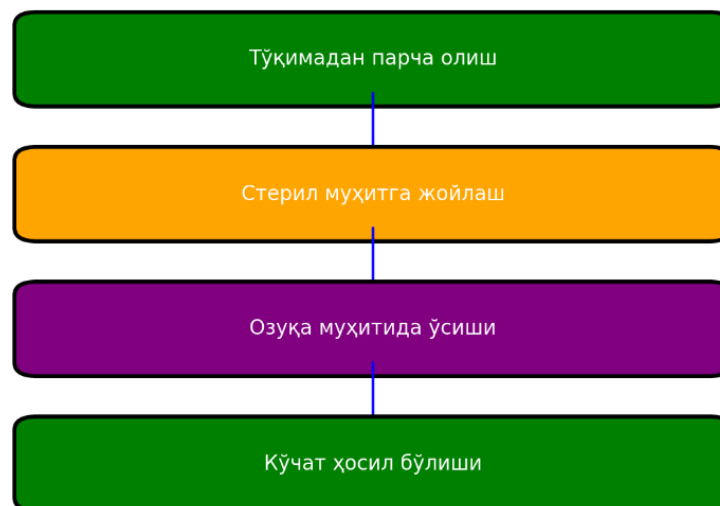
*Plumeria* grows well in well-drained, sandy, humus-rich soils. Organic fertilizers (compost) and mineral fertilizers (NPK 10:10:10) are recommended monthly during the summer. Excess moisture can cause root rot, so proper drainage is critical.

**Figure 4. *Plumeria* seedlings and trees in a greenhouse.****Table 3. Irrigation and Fertilization Norms**

Season	Irrigation	Fertilization
Summer	Every 2–3 days	NPK mineral fertilizer monthly
Autumn	Every 5 days	Organic fertilizer (compost) once
Winter	Reduced watering	No fertilization
Spring	Every 3–4 days	Mixed organic and mineral fertilizers

#### 4. Adaptation Experiments in Uzbekistan

Experiments were conducted in Namangan, Tashkent, and Bukhara. Plants grow well outdoors in summer but should be transferred to greenhouses in winter. Results indicate that *Plumeria* is adaptable and can be used as an ornamental tree in Uzbekistan.

**Figure 5. *Plumeria* seedling during care process.**

### Conclusion

The cultivation of *Plumeria* in Uzbekistan is scientifically feasible. With adherence to agrotechnical requirements, it can serve as an ornamental tree in urban and rural areas, offering aesthetic value and contributing to tourism and economic development.

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