

## Soil for Tuberose Cultivation

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Tuberose (*Polianthes tuberosa*) is a perennial plant known for its fragrant flowers. It belongs to the family Asparagaceae and is native to Mexico. The plant produces long, slender spikes of waxy, white flowers that are highly valued for their scent, making them popular in the perfume industry. Additionally, tuberose is widely used in ornamental gardening and as cut flowers.



### Introduction to Tuberose

- **Scientific Name:** *Polianthes tuberosa*
- **Family:** Asparagaceae
- **Common Names:** Tuberose, Rajnigandha (In India)
- **Origin:** Native to Mexico
- **Flowering Season:** Typically blooms during summer and early autumn
- **Uses:** Perfume industry, ornamental gardening, cut flowers

Tuberose is cultivated mainly for its essential oil, which is extracted from the flowers. The oil is a key ingredient in many luxury perfumes due to its rich and complex fragrance. In addition to its use in perfumery, tuberose is also grown for its aesthetic appeal and used in floral arrangements.

### Area of Tuberose Cultivation

Tuberose is grown in many tropical and subtropical regions around the world. The major producing areas include:

- **India:** India is one of the largest producers of tuberose, with major cultivation areas in the states of Karnataka, Tamil Nadu, West Bengal, and Maharashtra. The flower is locally known as "Rajnigandha" and is widely used in garlands and for temple offerings.
- **Mexico:** Being the native region, Mexico continues to cultivate tuberose. The plant thrives in the warm climate of the region.
- **France:** Particularly in the region of Grasse, known as the world's perfume capital, tuberose is grown for the perfume industry.
- **China:** Another significant producer, with tuberose grown in provinces such as Yunnan and Fujian.
- **South Africa:** Some areas in South Africa are suitable for tuberose cultivation, contributing to both the local and export markets.

Tuberose prefers well-drained soils and a warm climate. It requires moderate watering and benefits from a sunny location. The plant is propagated through bulbs and typically flowers in the first year of planting.

## Soils for Tuberose Cultivation

Tuberose (*Polianthes tuberosa*) thrives in specific soil conditions that provide the right nutrients, drainage, and texture. The choice of soil is crucial for healthy plant growth, optimal flowering, and the quality of tuberose essential oil. Here are the key soil requirements and characteristics for successful tuberose cultivation:

### 1. Soil Type

- **Loamy Soil:** Tuberose grows best in well-drained loamy soil, which is a balanced mixture of sand, silt, and clay. This type of soil offers good aeration, moisture retention, and drainage, essential for healthy root development.
- **Sandy Loam:** Sandy loam soils are also suitable for tuberose cultivation. They provide excellent drainage, reducing the risk of waterlogging, which can cause root rot and other diseases.

### 2. Soil pH

- **Slightly Acidic to Neutral:** The ideal soil pH for tuberose is between 6.5 and 7.5. This range allows optimal nutrient availability and uptake. Soils that are too acidic or too alkaline may require amendments to adjust the pH level.

### 3. Soil Fertility

- **Nutrient-Rich Soil:** Tuberose requires fertile soil rich in organic matter. Adding well-rotted compost or organic manure can enhance soil fertility, providing essential nutrients like nitrogen, phosphorus, and potassium.
- **Balanced Fertilization:** Regular application of balanced fertilizers (such as NPK 10-10-10 or 20-20-20) supports healthy growth and flowering. Fertilizers should be applied according to the growth stage of the plant.

### 4. Drainage

- **Good Drainage:** Tuberose bulbs are susceptible to rot in waterlogged conditions. Ensuring good drainage is crucial, particularly in heavy clay soils, which may require amendments such as sand or organic matter to improve drainage.

### 5. Soil Preparation

- **Tillage and Bed Preparation:** Proper soil preparation includes tilling the soil to a depth of about 30-40 cm to remove weeds and aerate the soil. Raised beds can be created to further enhance drainage and ease of access.
- **Soil Amendments:** Incorporating organic matter, such as compost or leaf mold, improves soil structure, moisture retention, and nutrient content. In sandy soils, adding organic matter helps retain moisture and nutrients, while in clay soils, it improves aeration and drainage.

### 6. Watering and Moisture Management

- **Consistent Moisture:** While tuberose prefers well-drained soils, it also requires consistent moisture, especially during the growing and flowering periods. Mulching can help retain soil moisture and regulate temperature.

### 7. Soil Health and Maintenance

- **Regular Testing:** Periodic soil testing helps monitor nutrient levels and pH, allowing for precise adjustments and fertilization.
- **Pest and Disease Management:** Healthy soil reduces the risk of pests and diseases. Integrated pest management (IPM) practices can help maintain soil health and prevent infestations.

By paying careful attention to soil conditions and management practices, growers can maximize the health and productivity of tuberose plants.

The quantity of tuberose flowers produced in well-prepared soil conditions can vary based on several factors, including the variety of tuberose, local growing conditions, and cultivation practices. However, with optimal conditions and proper care, growers can achieve a high yield.

### **Estimating Yield of tuberose in optimum soil condition**

**Per Plant:** With optimal conditions, each tuberose plant can produce several spikes, each with numerous flowers. For example, if a plant produces an average of 3 spikes, each with 25 flowers, it can yield around 75 flowers per plant.

**Per Hectare:** The yield per hectare depends on planting density. Typically, tuberose is planted with a spacing of 15-20 cm between bulbs and 20-30 cm between rows. With these spacings, one hectare can accommodate approximately 50,000 to 70,000 bulbs. Assuming an average production of 3 spikes per bulb and 25 flowers per spike, the yield can range from 3,750,000 to 5,250,000 flowers per hectare.

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