



## Studying Methods of Rapid Propagation of Lemon Seedlings from Green Cuttings

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### **Abstract:**

Decree of the President of the Republic of Uzbekistan on additional measures for the rapid development of fruit and vegetable production in the Republic of Uzbekistan, comprehensive measures aimed at expanding production, storage, processing and export of fruit and vegetable products are being implemented. Cultivated areas have been significantly expanded for the implementation of projects for the intensive development of fruit and vegetable production, capacities for storage and processing of fruit and vegetable products have been launched, and financial resources, including funds from international financial institutions, are being actively attracted. At the same time, the high level of competition in the markets of foreign fruit and vegetable products requires the rapid introduction of modern methods of agrotechnics and management of production and product delivery processes.

**Keywords:** fruit, lemon, plants, products, subtropical, vegetable production, food supplements, flowers, plant.

**Introduction:** Lemon *Citrus limon* L is a subtropical crop with high nutritional and medicinal properties. Modern medicine highly values lemon fruits as a means of prevention and treatment of scurvy, respiratory and gastrointestinal diseases. Its sour juice is used to make lemonades, food supplements and lemon kilos. Fruits and peel are used in confectionery production. Essential lemon oil is obtained from the skin of its fruit. The trees reach a height of up to 5 m, depending on the variety, grafting, cultivation and growing conditions. The flowers are self-pollinating, very fragrant, and have a distinctive red color. The fruits are oval or egg-shaped, with a nipple-like growth on the tip, the number of compartments is 8-10, sometimes up to 12. The weight of the fruit varies from 40

to 400 g, depending on the variety and agrotechnics. The skin of the fruit is medium thick or thin, turning yellow when fully ripe. The surface is smooth, sometimes with rough convex oil glands, with a characteristic smell and sour taste typical of lemon. Contains hesperidin, citric acid and vitamin C. Red-red color is also observed in young branches of lemon. Lemon grows 3-4 times a year. The growth of the branches begins approximately with the first leaves in the conditions of the subtropical regions of Uzbekistan, when the total useful temperature in the open ground is 1020. In sheltered areas, lemons grow 3 times, and a fourth growth may occur when autumn comes warm and lasts a long time. New leaves and branches mature between growth cycles. Like all citrus plants, lemons change their leaves regularly, and the king sabbath consists of different types of branches.

Vegetative propagation is the regeneration of a plant from its vegetative parts, stem, root, bud or leaf. This method of reproduction is based on the ability to completely regenerate plants from any part of it. As long as only somatic cells are involved in the regeneration of a new plant in vegetative propagation, then the new plant does not differ from the mother plant at all. However, it should not be forgotten that even in vegetative reproduction, plant changes due to mutation or variation of shoots are possible, although it occurs in rare cases. Citrus plants can be propagated by the following vegetative methods: rooting of woody or green cuttings, grafting of shoots or cuttings, grafting, etc. Rooting woody or green cuttings gives the best results in lemons among citrus plants. For this, 8-10 cm long cuttings with 3-4 eyes are prepared from its branches formed last year.

When preparing cuttings, the lower cut is made directly below the bud, and the upper one is made 1-1.5 cm above the bud. In order to stop the rapid evaporation of moisture in cuttings, the number of leaves in them is reduced or the leaf is cut in the middle. The cuttings are tied in 40-50 pieces, and for good rooting, they are placed in the working solution of IMK indoleic acid, a growth regulator, at a depth of 2-2.5 cm for 14-16 hours. After being treated in a solution of a growth regulator, they are planted at a depth of 4-5 cm in a specially prepared substrate consisting of a mixture of river sand and humus in a ratio of 1:1. For rooting of cuttings, film greenhouses with internal microclimate control are required, that is, they are periodically sprayed with water in the form of a mist. It should not be forgotten that the rooting of cuttings does not give good results in some citrus fruits, for example, mandarin, orange, that is, in this case, they often go wild and become less productive even when they grow strongly. Therefore, this method is recommended only for lemons in Uzbekistan.

Fruits prepared for seed production, such as Meyer lemons, sweet oranges, sour grapefruits, etc., are stored in crates or in smaller piles until they begin to rot slightly when fully ripe. In this case, it is necessary not to allow the fruits to overheat in heaps. Then the fruits are crushed and the seeds are separated. The obtained seeds are washed in water. The seeds that have floated to the surface of the water are removed, and those that have sunk are removed and dried in the shade for 1-2 days. Freshly prepared seeds are immediately planted in the soil for lateral germination of seedlings. If the seeds are planned to be planted in the spring, they are stratified on a wet substrate of sand, sawdust, perlite, etc. Three to four parts of substrate are used for one part of seeds. In recent years, it has been widely used to store seeds in polyethylene bags in refrigerators at a temperature of +5+70C. The seeds are sown 2-3 cm deep in 1 m wide and 15-20 m long pushts arranged 15-20 cm above the soil level at a distance of 20 cm. In large areas, two-row planting is carried out. In this case, the row spacing is 70-80 cm, the double row spacing is 25 cm, and the plant spacing in the row is 2-3 cm. Seeds can also be sown in greenhouses or boxes with a substrate, in which case the sprouts will germinate later. Although manual knitting requires a lot of work and manpower, it gives a very good result. Timely and quality maintenance of spiked sprouts and their soil allows for good root development of plants.

If these works are done on time, it is possible to grow one-year seedlings suitable for grafting cultivated oranges, lemons, tangerines and other crop varieties during one growing season. Later,

during the growth and development of the tree, after the first and subsequent shoots planted for the purpose of shaping, one after the other, branches begin to branch from above, their number gradually increases. In terms of fruiting, fourth-order branching is transient, and the highest-order branches become mainly fruit-bearing branches.

In the conditions of Uzbekistan, a lot of lemons are grown from citrus fruit crops. In our climatic conditions, lemon, which is a perennial evergreen plant, can be grown only in greenhouses, creating an artificial environment.

Lemon planting and care. Citrus fruits, including lemons, are not very cold-resistant, therefore, in the conditions of Uzbekistan, they can be grown only in trenches, in greenhouses, only by creating artificial conditions. Although it is more expensive to grow lemons in a greenhouse, an average of 200-250 fruits per tree can be obtained when grown in a greenhouse, and 400-500 lemons are grown in a greenhouse. One of the conditions required to obtain a consistent bountiful harvest of lemons is to adapt the growing conditions to the requirements of the variety. Variety testing and production experiments show that Meyer, "F-2 Jubilee" and "Willy Frank" lemon varieties are very suitable for growing in greenhouses.

Preparation and planting of land for planting lemons. For planting lemon seedlings, the soil of the greenhouse should be leveled well and worked to a depth of 50-60 cm. 60-80 tons of rotted manure, 600 kg of superphosphate and 150 kg of potash fertilizers are added per hectare. In the greenhouse, it is advisable to plant lemon seedlings in a 3x4 m scheme. After the planting sites are planned, holes are dug to a depth of 60 cm. During planting, 10-15 kg of rotted manure, 100-150 g of superphosphate and 50 g of potassium fertilizers are added to each pit. One- and two-year-old lemon seedlings with well-developed roots should have up to 3-4 first-order branches with a body thickness of 0.7-0.8 cm, and two-year-old lemon trees with second-order branches and a body thickness of at least 1 cm.

In autumn, lemon seedlings must be planted together with the soil adjacent to the roots, because otherwise some of the seedlings may dry out. Transplanting, as well as excess branches that thicken the branches, as well as damaged roots are cut. Seedlings are planted with the help of planting boards for planting on stakes driven into pits. In this case, the root neck of the seedlings must be 2-3 cm above the soil surface. After the seedling is planted, the soil is compacted by pouring a bucket of water into each hole. Then it is watered by leaving 25-30 cm from both sides of each row. Irrigation is carried out through egates taken at a depth of 15-20 cm. In this case, the water is drained until the soil becomes soft to a depth of 40-50 cm. At first, the seedlings are watered every day or two, and after the plants are waterlogged, water is given periodically, but the soil should be kept moist throughout the growing season. In the third year, irrigation water is taken at a depth of 30-40 cm at a distance of 50 cm from the plant. For good growth and yield of lemon, the optimum soil moisture should be 70-85% relative to DNS. Lemon seedlings should be watered frequently during the season until March 25. The number of watering depends on the weather conditions and the condition of the plants. On sandy soils, lemon should be watered on average 1 time in February, 2 times in March, 3 times in April and May, 4 times in June, 4-5 March in July and August, 3 times in September, 2 times in October, 1-2 times in November. Then until March 5-6, manure juice will flow. On hot summer days, lemons are watered in the evenings and mornings. After each watering, the soil is softened to a depth of 10-15 cm. After the plants are harvested, they are planted with soil softening and watering.

In the winter, the rows are dug deep, and rotted manure and superphosphate are added. Further processing is carried out by watering or applying manure juice and feeding with mineral fertilizers. Care must be taken when working the land, because the main root of the plant is located at a depth of 15-25 cm. Weeds should be regularly pulled and removed from the greenhouse, as they may carry aphids and other pests. From the second year after planting lemon seedlings, manure and

superphosphate are added to the soil during autumn cultivation. 10 kg of manure, 20 g of phosphorus and nitrogen, and 10 g of potassium are applied under each of the one-, two- and three-year-old seedlings, and 20-25 kg of manure and 80-120 g of phosphorus and nitrogen are applied to mature trees. and 40-60 g of potassium is given. Depending on the age of the plants, the amount of applied fertilizers is increased.

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