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Technology of Propagation of Lemon Plants from Cuttings

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ABSTRACT

In this article, propagation of lemon seedlings, phenological observations during their propagation, biological phases during callus and rooting of lemon seedlings are studied in cross-section of varieties.

KEYWORDS: *lemon, seedling, technology, temperature, humidity, biological efficiency*

INTRODUCTION

Among the fruit plants grown in the republic, citrus plants occupy a special place. Citrus plants are very diverse in the world, among which lemon, orange, tangerine and grapefruit are the most common.

Citrus fruits contain a large amount of vitamins, minerals, organic acids, and healing nutrients necessary for the human body. In particular, lemon is the most cultivated citrus plant in Uzbekistan, and it is considered one of the most valuable healing and refreshing fruits.

Around the world, the lemon plant is mainly propagated by vegetative (cutting). Vegetative method - it is said to regenerate the mother plant from a piece taken from a somatic part of the mother plant. The seedling grown in this way fully preserves all the biological properties of the mother plant [3].

Citrus family Plantae, Angiosperms group (or informal phylum), Eudicots (or Eudicots), Sapindales order, Rutaceae family, Aurantioideae subfamily enters. There are about 160 genera of the family of rutabagasand consists of 1650 species of large shrubs and small or medium-sized (5-15 m) trees [6].

Citrus fruits, including lemons (Citrus limon), are evergreen plants that now grow in a variety of climates between latitudes 40°N (Corsica, Japan) and 40°S (New Zealand), from the warm humid conditions of the equator to the subtropical climates of the Mediterranean. grows and bears fruit in places [6].

It is propagated from lemon cuttings and grafting. It is planted in the garden in a scheme of 2.5x4 m. It gives a harvest in the 3-4th year after transplanting. Lemon is a heat-loving, light-loving and moisture-demanding plant. Fruits and unripe branches at -1.5-2°C are affected by frost at -5-6°C. It develops well at an air temperature of 17-18°C. Lemon gives an abundant harvest in humus-rich, well-draining, light soils [5].

90-94% rooting was achieved in lemon cuttings of the Meyer variety when heteroauxin was treated at a very high rate of 2000 mg/l for 24 hours [2]. When lemon cuttings were treated with heteroauxin at different rates (from 100 mg/l to 200 mg/l) for 12, 16 and 20 hours, 96% rooting of cuttings was achieved when treated with 200 mg/l solution of heteroauxin for 12 hours [5]. When Meyer lemon cuttings were treated with vitamin C in a 0.02% solution of indolylacetic acid for 12 hours, the cuttings took 100% root within 35 days [1].

Research methods. A number of scientific studies have been conducted on the rapid propagation of lemon plant seedlings from cuttings. In the research, observations and biometric calculations were carried out to determine the growth and rooting of cuttings of lemon plant varieties. Also, conducting experiments B.A. Dospekhov "Metodika polevogo opyta" [M.: Kolos, 1973] and "Main agricultural crops care and central cultivation. Sample technological cards for 2006-2010 [Tashkent, QSXV. 2006] is based on methodological recommendations.

Research results. In the rapid propagation of lemon seedlings from cuttings and in green cuttings of other plants, the process of the formation of additional roots is mainly due to plastic substances previously accumulated in the cuttings, the amount of these substances depends to a certain extent on the length of the cutting.

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.

In vegetative reproduction of lemon seedlings, rooting under conditions of artificial fog, this year's green varieties were cut from the collection garden of citrus plants. For the experiment, Meyer, Tashkent, first-fruits of Uzbekistan varieties of lemons were selected. Before planting, the cuttings were treated with a 0.05% solution of carnivin and heteroauxin for 14-16 hours.

When propagating lemon varieties from cuttings, the use of varieties in this year's green state significantly affects the rooting and development of cuttings made from them. In all varieties of lemon, the development of green shoots was observed to be accelerated.

When lemon cuttings were propagated by both methods, the same rooting characteristics were seen in the cultivars, but lemon (control) was not treated without the experimental solution.

The phenological observations of rhizogenesis phenophases were made in cuttings and the following results were obtained. The results of phenological observation are presented in Table 1.

Table 1. Phenophases of rhizogenesis in citrus cuttings of different ages

(Field experience, Tashkent region, Scientific Research Institute of Horticulture, Viticulture and Winemaking named after Academician M. Mirzaev, 2022)

Research methods	Type and variety	Rooting phases of cuttings, day			
		Callus formation	Root formation	Complete rooting	Bud growth
Green semi-wooden pens	Meyer (control)	-	-	-	-
	Meyer	16-18	21-23	26-28	26-28
	The first-born of Uzbekistan	16-18	21-23	26-28	26-28
	Tashkent	16-18	21-23	26-28	26-28
Green wooden pencils	Meyer (control)	29-32	41-42	48-52	26-28
	Meyer	10-12	18-19	22-23	20-21
	The first-born of Uzbekistan	10-12	18-19	22-23	21-22
	Tashkent	10-12	18-19	22-23	21-22

The development process of the root part of the rooted cuttings of different ages was also observed (Table 2).

When propagating lemon varieties from cuttings, it was observed that the more woody the varieties, the faster rooting and development in them. But when preparing a pen, it is necessary to take into account that the varieties are not in a herbaceous state and that the shoots are ready to wake up.

We observed that the green cuttings of all lemon varieties do not show the same growth and development in the conditions of artificial fog. It was found that they can be divided into light, medium and complex rooting groups according to their biological origin.

Table 2 Rooting process in cuttings of citrus plants of different ages

(Field experience, Tashkent region, Scientific Research Institute of Horticulture, Viticulture and Winemaking named after Academician M. Mirzaev, 2022)

Research methods	Type and variety	Rooting of cuttings,%
Green semi-wooden pens	Meyer (control)	-
	Meyer	93,0
	The first-born of Uzbekistan	91,0
	Tashkent	83,0
Green wooden pencils	Meyer (control)	45,0
	Meyer	97,0
	The first-born of Uzbekistan	98,0
	Tashkent	90,0

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