

Enthält wachsende Granatapfelsämlinge aus grünen Stecklingen

**Yakubov Mir jamil Mirziyatovich** Kandidat für Agrarwissenschaften,  
Wissenschaftliches Forschungsinstitut für Gartenbau, Weinbau und Weinbau des  
Akademienmitglieds M. Mirzaev

**Sabirov Shukhrat Yunusovich** Wissenschaftliches Forschungsinstitut für  
Gartenbau, Weinbau und Weinbau benannt nach dem Akademienmitglied M.  
Mirzayev

**Zusammenfassung:** Der Artikel beschreibt die vielversprechendste Methode zum Anbau von Granatapfel mit grünen Stecklingen unter künstlichen Nebelbedingungen unter einem Filmschutz. Die Indikatoren für die Bewurzelung von Stecklingen von 4 Granatapfelsorten und die Entwicklung von Pflanzen daraus werden durchgeführt. Es wird darauf hingewiesen, dass es mit der Technologie der grünen Stecklinge möglich ist, 1,6 – 2,4 Millionen Setzlinge aus einem Hektar einer nebelbildenden Pflanze zu gewinnen (mit einer durchschnittlichen Bewurzelungsfähigkeit von 71-97% der Stecklinge).

**Schlüsselwörter:** Granatapfel, Stecklinge, Sämling, Bewurzelung, Sorte

### **Features growing pomegranate seedlings from green cuttings**

Yakubov Mir jamil Mirziyatovich Candidate of Agricultural Sciences, Scientific Research Institute of Horticulture, Viticulture and Winemaking of Academician M. Mirzaev Sabirov Shukhrat Yunusovich Scientific Research Institute of Horticulture, Viticulture and Winemaking named after Academician M. Mirzayev

**Abstract:** The article describes the most promising method of growing pomegranate with green cuttings in conditions of artificial fog under a film shelter. The indicators of rooting of cuttings of 4 varieties of pomegranate and the development of plants from them are carried out. It is noted that using the technology of green cuttings, it is possible to get 1.6 – 2.4 million seedlings from a hectare of a fog-forming plant (with an average rooting capacity of 71-97% of cuttings).

**Keywords:** pomegranate, cuttings, seedling, rootability, variety

Pomegranate-- is one of the most widespread subtropical crops in Uzbekistan. Large pomegranate plantations are found in the southern regions of the republic – in Surkhandarya, Kashkadarya regions and in the regions of the Ferghana Valley.

Everything is useful in pomegranate: each part of it contains substances and trace elements that are used in cooking and medicine.

Pomegranate contains two substances that effectively protect against harmful effects and toxins, as well as prevent premature aging. Punicalagin, contained in the

juice and peel of pomegranate, according to studies, has greater antioxidant activity than green tea and red wine. Punic acid is used in the preparation of pomegranate oil, often used for cosmetic purposes. Both of these components have a beneficial effect on the human body, reduce the risk of various diseases and promote cell regeneration.

In the economic use of culture, it is important to know the rational way of its reproduction in a short time.

Pomegranate can be propagated by seeds, basal growth and cuttings of shoots. The most effective way of propagation of pomegranate is growing seedlings from cuttings.

The traditional method of pomegranate propagation is the harvesting of lignified cuttings and their rooting is characterized by a low reproduction coefficient. Pomegranate seeds have a rather low germination rate, seed renewal leads to a high splitting of traits in the offspring with a decrease in economically valuable parameters of samples, which contradicts the requirements related to the variety. In this regard, the task was set to investigate the possibility of vegetative reproduction of valuable pomegranate by the method of green cuttings in conditions of fine moisture for further accelerated creation of industrial plantings.

One of the ways to solve the problem of increasing the release of pomegranate planting material is its accelerated reproduction by the method of green cuttings. Many fruit crops are successfully propagated by this method. However, the reproduction of pomegranate by green cuttings is poorly studied. In this regard, the improvement of technological methods of propagation of pomegranate by green cuttings in the conditions of Uzbekistan, which is based on artificial fog, growth regulators and optimal growing modes that significantly accelerate the yield of standard root-related seedlings and allow overcoming the shortage in planting material in a short time, is an urgent scientific direction.

The aim of the research is to improve the technological methods of propagation of pomegranate by green cuttings for accelerated production of standard root-related planting material and the laying of intensive industrial plantings in the conditions of Uzbekistan.

The most promising method of accelerated cultivation of pomegranate is green cuttings in conditions of artificial fog under a film shelter (S. V. Ostroukhova, A. I. Danilov, M. T. Tarasenko, A. T. Dzhananbekova, A. Umarov) A high reproduction coefficient with this method allows you to increase the production of planting material. In this regard, in the conditions of the dry hot climate of Uzbekistan.

Cuttings were carried out in a fog-forming installation located at the experimental experimental station of the Akdamik M. Mirzayev NIISViV. Cuttings were cut 8-12 cm long with two leaves shortened by half, treated with an aqueous solution of indolylacetic acid (50 mg/l) for 12 hours and planted according to the 7X4 cm scheme. Cuttings were planted on June 25 to a depth of 1.5-2 cm in granular river sand, underlain by a 17-20 cm nutrient layer of a mixture of humus and sand (1:1).

During the rooting period of the green cuttings (within 30 days after planting), the fog-forming installation worked in automatic mode from 8 to 20-21 hours. Water was sprayed every 10-15 minutes for 15-20 minutes. After mass rooting of cuttings, the interval between water sprays was increased to 15-20 minutes or more, and in August it was carried out only 2-3 times a day. To harden the plants, film shelters were removed from the greenhouses.

The microclimate and fogging installation during the rooting period of cuttings was characterized by the following indicators: the average daily air temperature in the greenhouse was - 25.90C with fluctuations in the daytime - from 27 to 31.90C, and at night from 19 to 23.90C. The substrate temperature reached 23-260C (minimum 19.40C, maximum 29.80C). The average daily relative humidity is 74-81%, dropping to 68-74% in the daytime and increasing 79-80% at night. These indicators for green cuttings and rooting of cuttings are close to optimal for the conditions of Uzbekistan, since in an open area during this period, the air temperature averages 25.1-27.90C, and the humidity is 34-39%.

Experiments have shown a high susceptibility to root formation of green cuttings in the studied pomegranate varieties (Table 1).

It should be noted that the phases of rhizogenesis in cuttings of all varieties began quickly and simultaneously: callus formation at 3-4 days, the beginning of root formation at 6-8, massive root formation at 10-12 and the beginning of shoot growth on the 10-12th day after planting, then there are shoots in cuttings appear simultaneously with massive root formation.

Research has shown that pomegranate varieties according to their ability to regenerate roots in green cuttings can be conditionally divided into the following groups: easily rooted - Achik –dona, Onne rooting rate was 95–97%; Medium-rooted Venderful 83.9%; Poorly rooted - Kazake –anor with a rooting rate of 71.6%.

It should be noted that the rooting rate of cuttings does not always correlate with the development of plants from them. In some varieties with a high rooting rate of cuttings, less developed plants (Venderful) are formed by autumn than in poorly rooted ones (Kazake –anor). Differences in the rooting rate of green cuttings and the development of plants from them are due to their biological characteristics and the inconsistency of rooting regimes for some varieties.

Average indices of rooting and development of the root system in green cuttings of pomegranate varieties

Pomegranate variety	Rooting, %	Root system			Aboveground part	
		Quantity roots of the 1st order, pcs	The total length of the roots of the 1st order, sm	Root system volume, sm <sup>3</sup>	The thickness of the conditional root	Plant height, sm

					collar, mm	
Achik–dona st	95,3±1,34	11,4	383,1	7,8	4,7	54,8
Kazake– pomegranate	71,6±3,17 65,9±4,79	10,6 7,4	199,7 199,7	5,7 4,7	4,1 4,1	39,7 49,7
Venderful	83,9±2,31	16,2	367,9	9,2	3,9	43,1
Onne	97,1±1,13	17,3	334,4	7,3	4,3	51,6

Experiments have shown that by the end of the growing season, unequal plants are formed from rooted pomegranate cuttings. Weaker development, especially of the aboveground part of plants, is noted in the easily rooted variety ONNE. In the remaining varieties, rather developed plants with a powerful root system and aerial part are formed in four months, but they do not reach the size of standard seedlings and, like the plants of other varieties, need to be grown annually in the open ground under the conditions usual for a fruit nursery.

Taking into account the development of the root system showed that the most developed plants were obtained from the variety Venderfulya. On average, there were

The table data indicate that the highest rooting rate of green cuttings of 97.1% was observed in the ONNE variety.

The table data show that during the three months of vegetation, a fairly developed aboveground part is formed from green pomegranate cuttings in the conditions of Uzbekistan.

## CONCLUSIONS

1. In the hot climate of Uzbekistan in greenhouses with artificial fog under a film shelter, optimal conditions are formed for rooting of green cuttings of the pomegranate variety.

2. The tested pomegranate varieties can be divided into three groups according to the rooting rate of green cuttings: easy rooting (95.3 - 97.1%) was shown by the Achik-dona st and Onne pomegranate varieties, medium-rooted (83.9%) Venderful and poorly rooted (71, 6%) in the Kazake –anor variety.

3. Applying the technology of green cuttings, it is possible to obtain a human-forming plant from a hectare with an average rooting rate of cuttings (71.6 - 97.1%) of 1.6-2.4 million pieces, that is, 8 - 10 times more compared to their vertical propagation. layering in the open field.

### References

1. Tarasenko M.T., Ermakov B.S. New technology of plant propagation by green cuttings. Toolkit. M: TSKHA, 1968.

2. Shishkina E.A., Litvinova T.V. technological methods of reproduction of subtropical fruit crops with decarative properties. Collection of scientific works of GNBS. 2015.Vol. 1. From 169-173.

3. Pavlova A.Yu., Dzhura N.Yu., Tut E.A. Reproduction of ornamental crops by green cuttings in a limited amount of substrate. Collection of scientific works of GNBS. 2017.Vol. 144. S. 202-205.

4. Umarov A. Obtaining own-rooted plum saplings in the conditions of Uzbekistan. Intensification of fruit growing and viticulture. Scientific works of Tash Agricultural Institute 1987 S. 40-45.