



## **TECHNOLOGY OF GROWING PLANTS OF PAULOWNIA IN INVITOR**

Djuraev Muqimjon Yaqubjonovich

Forestry Research Institute Andijan, Branch Researchers

Nazirjonov Ibrokhimjon Anvarjon ogli

Forestry Research Institute Andijan, Branch Researchers

Botiraliyev is the son of Lutfullo Abdugoffor

Forestry Research Institute Andijan, Branch Researchers

Sultanov Khumoyun Mahmudjon ogli

Forestry Research Institute Andijan, Branch Researchers

Anvarjonov Abbosvek Hayotbek ogli

Master of Andijan Institute of Agriculture and Agrotechnology

## **ПАВЛОВНИЯ ЎСИМЛИГИНИ IN-VITRO УСУЛИДА КЎЧАТ ЕТИШТИРИШ ТЕХНОЛОГИЯСИ**

## **ТЕХНОЛОГИЯ ВЫРАЩИВАНИЯ РАСТЕНИЙ ПАВЛОВНИЯ В ИНВИТОРЕ**

Джўраев Муқимжон Яқубжонович

Назиржонов Иброхимжон Анваржон ўғли

Ботиралиев Лутфулло Абдугоффор ўғли

Султонов Хумоюн Махмуджон ўғли

Ўрмон хўжалиги илмий-тадқиқот институти Андижон

филиали илмий ходимлари

Анваржонов Аббосбек Хаётбек ўғли

Андижон қишлоқ хўжалиги ва агротехнологиялар институти магистранти

### **Аннотация**

Ин-витро усулда кўчатлар етиштирилганда, нихоллар касалликлардан холи бўлиши, деярли бир хил ўсиши исботланган, бироқ илдиз қаламчалар кўчатларига тўғри ишлов берилса, ташкил этиладиган плантация ёки питомниклардан ин-витро усулда олинган нихолларга нисбатан юқори натижа олиш учун етарли бўлди. Катта майдонларда павловния дарахти





плантациялари ёки кўчатхоналари ташкил қилишда кўчат танловининг энг афзал варианты бу ин-витро усули ҳам яхши натижа кўрсата олди.

**Калит сўзлар:** фортуней, томентоза, Шан Тонг, маккажўхори, ғўза, помидар, бодринг, “De Nova Agro”, ин-витро, схема, платация, питовник, павлония, вегетация.

### **Аннотация**

При выращивании сеянцев *in vitro* сеянцы оказались безболезненными, росли почти одинаково, но при правильной обработке корневых черенков этого было достаточно для получения более высокого результата, чем у сеянцев *in vitro*, полученных из устоявшихся плантаций или питомников. Этот метод *in vitro* был также лучшим вариантом для отбора саженцев при создании плантаций павлонии или питомников на больших площадях.

**Ключевые слова:** форни, войлочные, Шан Тонг, кукуруза, хлопчатник, томат, огурец, «Де Нова Агро», *in-vitro*, схема, плато, питовник, павлин, растительность.

### **Annotation**

When seedlings were grown *in vitro*, the seedlings proved to be disease-free, growing almost the same, but if the root cuttings were treated properly, it was sufficient to obtain a higher result than *in-vitro* seedlings obtained from established plantations or nurseries. This *in-vitro* method was also the best option for the selection of seedlings in the establishment of pavlovnia tree plantations or nurseries in large areas.

**Keywords:** fortuney, tomentoza, Shan Tong, corn, cotton, tomato, cucumber, “De Nova Agro”, *in-vitro*, scheme, plateau, pitovnik, peacock, vegetation.

### **Introduction**

Pavlovniya is a tree that does not require much, it loves water, so it can be grown almost anywhere there is water. The main features in the cultivation of this tree are its rapid growth, large size, very strong roots.

In Uzbekistan, which currently imports 90 percent of its timber products, special attention is being paid to growing pavlovnia trees in order to localize timber production. According to the Resolution of the Cabinet of Ministers of August 27, 2020 "On measures to establish fast-growing and industrial pavlovnia tree





plantations in the country", due to soil and climatic conditions of the country, there is a shortage of water it is planned to establish pavlovnia plantations on lands with scarce or saline soils.

The parent forms of the Shan Tong variety, *P. fortunei* and *P. tomentosa*, are common in wild and artificial plantations in 3 major areas of China, and they are adapted to these regions. Due to the fact that the best genes of both forms are combined in the Shan Tong variety, it is more flexible to different regions. It can grow even in places where the parent forms do not grow. Many years of scientific research and observations have shown that Shan Tong can be grown not only in the new northern regions of China, but also in the United States, Germany, Bulgaria, Iran, Nepal, Vietnam, Burma, Laos, Uganda, Indonesia, Russia and Uzbekistan. All species of Pavlovnia are divided into two categories according to the shape of the crown. Long medium and wide conical. The crown of a tree with an elongated crown is 40 percent thinner than that of a tree with a broad conical crown. For example, *Tomentosa* Pavlovnia has a wide conical crown, while Shan Tong has an elongated crown, so more Shan Tong trees can be planted on 1 hectare of land than *Tomentosa*. It is also very convenient to grow along with annual plants in Shan Tong Pavlovnia plantations to get extra income, such as corn, cotton, tomatoes, cucumbers and so on.

Pavlovnia, which is twice as expensive as pine wood in world markets, is in growing demand, especially in the field of furniture and construction. Propagation of this plant in our country, the creation of pavlovnia areas, plantations in all regions will serve to create a cheap and high-quality alternative energy source, further reducing the demand for timber imports. In the laboratory, the pavlovnia tree is delivered to customers in the form of seedlings or saplings, depending on their demand. Today, most of them are exported to foreign countries such as Kazakhstan, Kyrgyzstan, Indonesia, Ukraine and Russia. The annual export volume is more than 2 million units.

### **The Main Part**

To propagate a tree, first of all, seedlings are needed. Pavlovniya has set up the only laboratory in Central Asia that prepares seedlings and saplings in vitro. Today, in the laboratory of De Nova Agro, in addition to pavlovnia, 35 varieties of grapes, berries and all types of fruit seedlings for intensive orchards are prepared in vitro. In the world experience, there are several methods of plant propagation, and modern in-vitro technology is the most effective.

The wild species of Pavlovnia, *Tamintoza*, can be propagated from seed, and because the plant from which the lyokin seed is inherited is not the same, its size and shape





also vary. As a result, less wood is obtained. When the peacock from the branch is tested, we see that the tree does not grow flat. With this in mind, the in-vitro method of peacock breeding is the most advanced, convenient method in the world. In the process, the plant buds are removed, the virus is cleaned of fungi using a special method, and transferred to an artificial nutrient. Then the first seedling is taken from that bud and other plants are removed from it. Our experiments were carried out in the laboratory of the Asaka forest plot of the Oriental Reality Forestry Research Institute of Asaka district of Andijan region.

Sowing time. Pavlovnia seeds or seedlings grown in the laboratory in vitro can be sown from March 20 to June 15. Before planting, pre-prepared furrows are watered, and the next day pavlovnia seedlings are planted in moist soil. Planted seedlings are immediately watered again. Seedlings need watering every day for 3–4 days. It is then irrigated depending on the structure of the soil. It is recommended to plant seedlings prepared from cuttings in autumn or early spring to establish plantations in the area allotted to pavlonia after the end of the growing season. If the seedlings are hit by a cold in the winter, they should not be removed, because pavlovnia seedlings produce a new twig from the root. Once the new branches are well developed, the ones that are best grown and the ones that have grown properly are removed.

Plantations can be planted in different schemes depending on what the purpose is. For example, it is recommended to plant Pavlovniya seedlings in 4x4, 5x4, 3x4 schemes to obtain building materials. Then an average of 600-800 seedlings per 1 hectare will be planted.

If pavlovnia plantations are planted for the production of briquettes, then they can be planted in 3x3, 3x2 schemes. If planted for briquettes, 1000-1200 seedlings will be planted on 1 hectare. Pavlovniya seedlings grown from seed are grown in the care department for a year. In order to obtain a standard seedling, seedlings are planted in a 0.7x0.7 scheme, ie 0.7 meters between rows and 0.7 meters between seedlings. In this scheme, an average of 20,000 seeds per hectare will be used.

### **Irrigation**

In-vitro pavlonia seedlings or saplings should be watered as much as possible in the first year. Because at this time the process of adaptation to the permanently planted soil takes place. Watering young seedlings 10-12 times during the growing season gives good results. In the second year of the growing season, the root system of seedlings will be much more developed.

During irrigation, the moisture should reach a depth of 60-70 cm, ie up to the root layer. Taking into account the agro-techniques, before watering the seedlings are





processed by hand at a depth of 10-15 cm. The agro-technical measures taken prevent the soil from becoming stagnant. Irrigation also significantly increases the growth period of the plant. In our experiments, it was found that in the first year, when the Pavlovian seed seedlings were watered in time, the seedlings reached an average height of 4 m.

### **Research Results**

Experiments have shown that peacocks are moderately water-demanding in the first and second years, during which time their root system is well developed as they are irrigated 10-12 times, so the number of irrigations has been reduced from 8 to 6 times. We know that it will not be possible to produce high-quality planting material for a long period of time in one place. Although soil fertility is grainy and fertile, over time their fertility decreases. When digging seedlings, along with the root system, tens of tons of fertile part of the soil from the planting area is removed by the root.

Therefore, it is important to fertilize forests with mineral fertilizers for seedlings. Timely and correct application of mineral fertilizers affects the healthy growth of seedlings and its quality.

In addition to mineral fertilizers, the application of organic fertilizers is also effective. To do this, during the autumn plowing or in early spring before plowing is applied at a rate of 25–30 tons per hectare. Experiments have shown that organic fertilizers are effective when irrigated with juice. When the roots of peacock seedlings planted in vitro are planted in the form of cuttings, the seedlings develop quickly, they are more resistant to adverse conditions when planted in this method, and the number of losses is lower due to the strong root system. When in-vitro nursery is done, the chances of getting root cuttings in the fall of this year will be high. Most importantly, varietal variability does not change.

When seedlings were grown in vitro, the seedlings proved to be disease-free, growing almost the same, but if the root cuttings were treated properly, it was sufficient to obtain a higher result than in-vitro seedlings obtained from established plantations or nurseries.

Pavlonia tree does not suffer from serious diseases like other trees, the growth, development, vigor of seedlings grown by root cuttings, the rate of plant death is reduced.

In conclusion, it can be said that in-vitro seedlings have many advantages over seed-grown seedlings. This in-vitro method was also the best option for the selection of seedlings in the establishment of pavlovnia tree plantations or nurseries in large areas.





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