EXPERIENCE OF GROWING ASIATIC ELM (ULMUS PUMILA) IN THE TASHKENT BOTANICAL GARDEN

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https://doi.org/10.5281/zenodo.11396432

Abstract. *The article discusses the experience of the Tashkent Botanical Garden in the field of growing Asiatic elm (Ulmus pumila), which is one of the most important components of the local ecosystem and has many valuable qualities. Asiatic elm is a tree species widespread in Central Asia, known for its decorativeness, rapid growth and resistance to adverse climatic factors. However, in recent years there has been a significant decline in its numbers due to outbreaks of mass infestation of the elm leaf beetle, which has become a cause of serious concern among specialists in the field of forestry and environmental protection. In this regard, the Tashkent Botanical Garden is introducing a technology for growing Asiatic elm, which can significantly increase the productivity and quality of the resulting plants. This technology includes several stages, each of which has its own characteristics and significance.*

Keywords*: small-leaved elm, seeds, soaking, Epin-extra, Zircon, germination, height, diameter.*

Introduction.

Representatives of the Elm family, considered the most promising species in forestry and landscaping, have been introduced into the Tashkent Botanical Garden since 1955; the first species were specimens of Far Eastern elms, including the field elm. In 1962, seedlings of this species were sent to the Kakrakalpak Botanical Garden, where they were also successfully introduced [1,2].

Asiatic elm (*Ulmus pumila*) in its natural habitat is distributed in Eastern Siberia, Khabarovsk and Primorsky territories of Russia, and North-Eastern China. This tree, reaching 15 m in height and 60-70 cm in diameter, forms a spreading tent-shaped crown. On the Western border of its natural range it occurs as a small shrub[3].

In the conditions of Uzbekistan, this species was successfully introduced, as evidenced by its morphometric characteristics. It reaches a height of 25-30 m, and the diameter reaches 1 meter. In the eastern part of Central Asia, this species is widely distributed along river valleys, gorges and mountain slopes. A special feature of this species is its branched, deep root system, which allows it to tolerate drought well and take root in steppe and semi-desert areas. Asiatic elm has exceptional resistance to adverse environmental influences, is a cold-resistant, relatively salt-tolerant, light-loving, fast-growing species Asiatic elm (*Ulmus pumila*) is the least susceptible to infection with the elm leaf beetle [4]. In the conditions of Uzbekistan, this species can be used as the main species in afforestation, when growing plantings for various purposes, as well as valuable raw materials for the plywood industry.

According to research by a number of scientists [5], it has been established that in the conditions of Uzbekistan, species of the Elm family do not reproduce by stem cuttings, despite various preplanting treatments. Thus, when creating Asiatic elm crops, it is better to use seed material, since the seeds germinate easily, without preparation, or they are mixed with wet sand 2-

3 days before sowing. A feature of the technology for growing Asiatic elm seedlings is to sow the seeds within 4-7 days after collection, since over time the soil germination of the seeds weakens. Seeds are sown in microdepressions. The ridges are deepened to 10-15 cm and moistened abundantly. It is recommended to sow at a shallow depth of 0.5-1 cm, since elm seedlings are very fragile and difficult to break through. The seeding rate is 6 grams. per linear meter. The main agrotechnical care of Asiatic elm crops consists of regular watering and the application of mineral and organic fertilizers.

Materials and methods. Scientific research on the cultivation of Asiatic elm in a generative way was carried out on the territory of the Far East exposition of the Tashkent Botanical Garden named after. acad. F.N. Rusanov at the Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan from February 2022 to May 2024. In the Tashkent Botanical Garden, Asiatic elm is cultivated using the generative method. The material used is freshly collected seeds, which are a flattened nut with membranous wings. Elm blooms in Uzbekistan on average from March 30 to April 15. The fruits ripen in the last ten days of April. After ripening for several days, the fruits begin to quickly fall off and be carried by the wind, so harvesting must be done in a short time. Despite the abundant fruiting, most seeds do not have normally developed ovaries.

As research material, we used seeds collected on May 20, 2022 from a specimen of Asiatic elm, 25 years old, growing at the exhibition of the Far East in the Tashkent Botanical Garden. The seeds were dried, dewinged and cleared of impurities. Despite the fact that many authors [5,6] talk about the success of seed germination without pre-sowing preparation, in our experiments we used several seed treatment options, 100 pcs. in each option (Table 1):

Control. Dry wingless seeds.

Option 1. Freshly prepared Zircon solution (10 drops per 100 ml of water). Soaking was carried out for 8 hours.

Option 2. Freshly prepared Epin solution (4 drops per 100 ml of water) Soaking was carried out for 18 hours

Option 3. Freshly prepared Gummi-30 solution (2 drops of solution per 100 ml of water). Soaking was carried out for 12 hours

Preparation of the soil for sowing seeds began in February 2022, the soil was plowed with rotation of the layer, after which ridges were manually formed according to the type of microdepressions measuring 1.5 by 2 m in the amount of 4 pieces, according to the seed treatment options. Organic fertilizers were added to the soil at a rate of 5 kg. per 1 m2. Immediately before sowing on May 20, the ridges was manually cleared of weeds and the top layer was dug up, after which watering was carried out at the rate of 5 liters per 1m2.

Seed sowing was carried out on May 22, 2022 manually on ridges according to seed treatment options, in a line 10 cm wide with a line spacing of 20 cm. Sowing was carried out at the rate of 20 pcs. on 1 line. The seed placement depth was 0.5 cm. After sowing, watering was carried out.

Agrotechnical care of seedlings consisted of watering 26 times in 2022, 24 times per growing season in 2023. Based on 10 liters. per m2. The ridges was periodically cleared of weeds (4 times during the growing season). On October 17, 2022 and March 27, 2023, sodium hummate 30% (1.5 ml/1 l of water) was applied to the root at the rate of 5 l. per 1 m2

Results and discussions. Research has shown that 6 days after sowing, seedlings began to hatch, and mass shoots appeared on June 2, 2022. On the ridges on which the seeds of option 1, treated

with Zircon, were sown, the number of seedlings was 45, that is, the germination rate for this treatment option was 45%. On f ridges, with sowing seeds of Option 2 - treated with Epin, the number of seedlings was 54, that is, the germination rate was 54%. On the ridges with sowing seeds of option 3 - treated with Gummi solution, the number of seedlings was 25 pcs, germination rate was 25%. The average acceptance rate for the options was 41.3% (Table 1.)

Picture 1. Fallows with sown seeds of small-leaved elm

Table 1.

Germination of Elm small-leaved according to seed treatment options.

Option No.	**Number of seeds, pcs.**	**A drug**	**Processing time, hours**	**Germination,%**
Control	100	-	-	19
Option 1	100	Zircon (10 drops/100 ml	8	45
Option 2	100	Epin-extra (4 drops/100 ml water)	18	54
Option 3	100	Gummi-30 (2 drops/100 ml water)	12	25
Average value				35.7%

During the research period (2022-2024), morphometric measurements of seedlings were carried out using a meter tape and an electronic caliper, the height and diameter of the trunk of seedlings were measured, after which the average values for the options were identified (Table 2, Figure 3). As a result of observations of seedlings, it was revealed that increased growth of shoots occurred in the period from April 25 to July 12.

During the first year of life, the average height according to the options for Asiatic elm seedlings was 49 cm (Figure 2), during the second year of life, the average height according to the options was 139.1 cm, that is, the annual increase was -90.1 cm.

Figure 2.Annual Asiatic elm seedlings

Figure 2. Carrying out morphometric measurements of two-year-old Asiatic elm seedlings

As can be seen from Tables 1 and 2, the best results in terms of germination and growth height of seedlings were observed in Option 2, in which the seeds were treated with Epin-extra solution. Germination turned out to be 54%, which is 12.7% higher than the average value and 35% higher than the control. The height of the seedlings by the end of the second year was 145 cm, which is 11.3 cm higher than the average value and 26.7 cm higher than the control. Thus, we can recommend this option for seed treatment when creating Asiatic elm crops in the conditions of Uzbekistan.

Table 2.

Results of morphometric measurements of Asiatic elm seedlings for 2022-2024.

Year	**2022**		**2023**		**2024**	
Processing option	**H,cm**	**D,mm**	**H,cm**	**D,mm**	**H,cm**	**D,mm**
Control	36.6	1.2	75.5	1.8	119.1	3.1
Option 1	48.1	1.9	95.3	2.6	139.5	4.7
Option 2	56.1	2.6	102.9	3.2	145.8	4.8
Option 3	43.4	1.5	89.2	2.3	133.6	3.7
Average value	46.1	1.8	90.7	2.5	134.5	4.1

Conclusion

In connection with the environmental situation and climate change in the territory of the Republic of Uzbekistan, it is necessary to select breeds that have high adaptability to arid conditions. Asiatic elm (*Ulmus pumila*), having such environmental features as cold resistance, drought resistance, salt tolerance, light-loving, undemanding soil conditions, is an ideal option for landscaping the cities of our republic. Asiatic elm can be used as a solitaire, alley planting, and also as a hedge, since this species tolerates molding pruning well [7,8].

To introduce elm into cultivation, it is necessary to grow high-quality planting material; according to a number of scientists [5,6], it is better to use 2-year-old seedlings. Our research has established that the best option for obtaining such planting material is to carry out row sowing in microdepressions of freshly harvested seeds that have been soaked for 18 hours in an Epin-extra solution. This processing method is widely used in the Tashkent Botanical Garden when sowing White Snowberry, which has low germination [9]. Also, an important condition is to carry out timely agrotechnical care, including watering and fertilizing.

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