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BIO-ECOLOGICAL CHARACTERISTICS, ORNAMENTAL FEATURES AND TECHNOLOGY OF GROWING SEEDLINGS OF MAPLE (ACER PLATANOIDES L.), MAPLE (ACER SEMENOVII RGL. ET HERD.) AND PENNSYLVANIA ASH (FRAXINUS PENNSYLVANICA MARSH)

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ABSTRACT

In the conditions of Uzbekistan, it consists in studying the bioecological characteristics of maple (Acer platanoides), Semenov maple (Acer semenovii) and Pennsylvanian ash (Fraxinus pennsylvanica Marsh.), developing the breeding technology for Acer platanoides), Semenov maple (Acer semenovii).) and Pennsylvanian shumtoli (Fraxinus pennsylvanica Marsh.), bioecological features are being studied, and breeding technologies are being developed.

KEYWORDS

Study of bioecological features of maple (Acer platanoides), Semenov's maple (Acer semenovii), Pennsylvanian sedge (Fraxinus pennsylvanica Marsh.), development of breeding technology.

Introduction

Today, 50% of the world's population lives in cities, and by 2050 this figure will reach 66%. Such a rapid population growth requires the improvement of urban infrastructure and the use of ornamental plants that are compatible with the urban environment. 3.2 million hectares of the territory of the republic are covered with forests. This is 7% of the total area. Of these, only 821 thousand hectares are occupied by cultivated forests. Thus, almost 2% of the country's territory is covered with forests. Natural forests are known to be rare in our country. For the natural reproduction of forests, it is very important to plant and breed various ornamental trees. According to the UN Convention on Biological Diversity, 34,000 plant species have been threatened with extinction in recent years. The emergence of various environmental problems in the world, global problems such as climate change, create a number of difficulties in gardening, choosing plants, and giving an aesthetic look to the environment.

Along with picturesque trees, the use of flowering shrubs adds to the aesthetic value of landscape design.

Special attention was paid to the identification of highly scenic, promising plant species resistant to various external harmful factors and the development of efficient and optimal methods of rapid reproduction as the priority directions of greening of residential areas in the world. In this regard, new varieties and forms of decorative species were created, the possibilities of trees and shrubs in modern landscaping were evaluated, new methods of vegetative reproduction were created, and optimal methods of reproduction from seeds were improved. It should be noted that representatives of the maple family have a wide range of decorative features, development of quick and effective methods of propagation of maple from seeds and vegetative reproduction, assessment of the efficiency of use in landscaping is of great scientific and practical importance.

Greening of residential areas and improvement of microclimate are among the advanced ideas of today. In order to continue the reforms implemented in all spheres, the development strategy of the Republic of Uzbekistan for the period of 2022-2026, known as "New Uzbekistan", was developed and a "road map" project was created for its implementation. This strategy includes seven priorities. On August 31, 2021, the opening ceremony of the "New Uzbekistan Park" dedicated to the 30th anniversary of the Republic of Uzbekistan was held. The general appearance of the 104-hectare park is in the form of five kings of trees, corresponding to the directions of the action strategy. Peaceful areas have been established here, where people can rest in harmony with nature. There is an increasing demand for seedlings of ornamental tree species in large quantities in greening the cities and villages of our republic. This puts important tasks before the growers of seedlings, such as breeding high-quality and inexpensive ornamental seedlings that meet standard requirements, as well as developing technology for rapid cultivation.

President of the Republic of Uzbekistan Sh.M. Mirziyoyev's national project "Green Space" was announced. As part of the project, it is planned to plant 200 million trees and shrubs per year. The national movement "Yuksalish" supports such initiatives aimed at increasing the number of trees in Uzbekistan. For this purpose, the campaign "One million trees" is being held in 6 regions of our Republic. Scientific implementation of tasks in the Cabinet of Ministers of the Republic of Uzbekistan "Rules for the organization of improvement works of settlements taking into account the requirements of modern architecture and urban planning" dated March 9, 2009 No. 59 and other legal documents This dissertation research serves to a certain extent in increasing.

The Main Part

Pheno-observation was conducted on maple species together with my scientific supervisor M. Turgunov and the following was found: Maple-leaf maple (Acer platanoides) is a tree 10-15 m tall, its characteristic feature is rapid growth and development in the first years. Native to all parts of North America. There will be no thorns. It is resistant to frost. The peak of flowering begins in the second half of spring. It consists of two centimeter, small flowers of light yellow color. We observed the phenology of representatives of the maple family and developed a vegetative propagation technology. First of all, we performed tasks such as land preparation, planting, maintenance, and fertilizing.

It is necessary to establish the nursery on a higher ground, taking into account the fact that maple seedlings in the nursery are not resistant to cold climate conditions. And the future expansion of this area is taken into account. The area is large square and rectangular. The soil should be fertile and flat.

The length of the nursery area can be 200-300m for 1-2, 300-400m for 2-5, 500-600m and longer for 5-10. The ground is T-4A before plowing in autumn and winter. It is leveled using PA-3, P-28, VP-8.0 levelers attached to DT-75 tractors. 10-12 tons of manure and 150-200 kg of superphosphate mixture are applied to the ground per hectare of leveled land. Then, in the fall, it is plowed on T-150, T-4, T-4A, DT-75 tractors with PL-5-35, PLN-535, PTN-40 plows at a depth of 35-40 cm. The land is plowed in Koklam. In the nursery, it is planted in rotation in order to increase the fertility of the soil. Crop rotation is very important in Central Asia, and a 7- or 9-field crop rotation scheme is used. Maple (Acer platanoides) favorite soil mixture - humus, turf, sand: 2: 2: 1 ratio. The plant does not like stagnation of water and alkaline soils. A huge plus of the bush is that it is resistant to waste pollution, so we can conclude that it can be safely planted in urban areas and parks, near busy roads and even in industrial areas. Fraxinus pennsylvanica is a tree with a height of 15-25 m, often with an irregular, spreading or one-sided crown. the body is brown-gray, felt bark and white lentil, the buds are brown. Blooms in April, fruits ripen in August. Common in North America. Introduced in 1783. Less winter-hardy and drought-resistant than the American species; it grows more slowly than the normal type and is less durable; when the soil is compacted or its great dryness, especially in populated areas, the tree may have a dry top. 500 healthy seeds of Fraxinus pennsylvanica were selected for planting in the spring season, and 100 seeds were selected and 5 different varieties were selected.

A place was selected from the garden area, agrotechnical treatment was carried out on the selected place on 03/07/2022, and fine soil and sand were prepared.

To plant the seeds:

20 hours in the control (plain water) option;

20 hours on the Kornevin stimulant;

18 hours on Ribav extra stimulant;

16 hours in heteroauxin stimulator;

14 hours in succinic acid; was thawed and the thawed seeds were planted in the experimental area on 18.03.2022 when the air temperature was +16 oC and the relative humidity was 53%.

The prepared place is 1x1 meter, the seeds are divided into 5 rows and the distance between the rows is 10-15 cm. The seeds were planted at a depth of 1.5-2 cm and covered with a mixture of humus-rich soil and sand, and the planted seeds were sprinkled with water.

Figure 1. Initial germination of sown seeds.

Figure 2. Fraxinus pennsylvanica branch and seeds

The initial germination of seeds planted on 03/18/2022 was observed on 04/08/2022 when the air temperature was +28 oC and the relative humidity was 50%. The state of germination of seeds was observed until 14.06.2022. At the same time, it was noted that the total height of young seedlings increased from 6 cm to 20 cm.

Figure 3. Botany is the process of picking seeds.

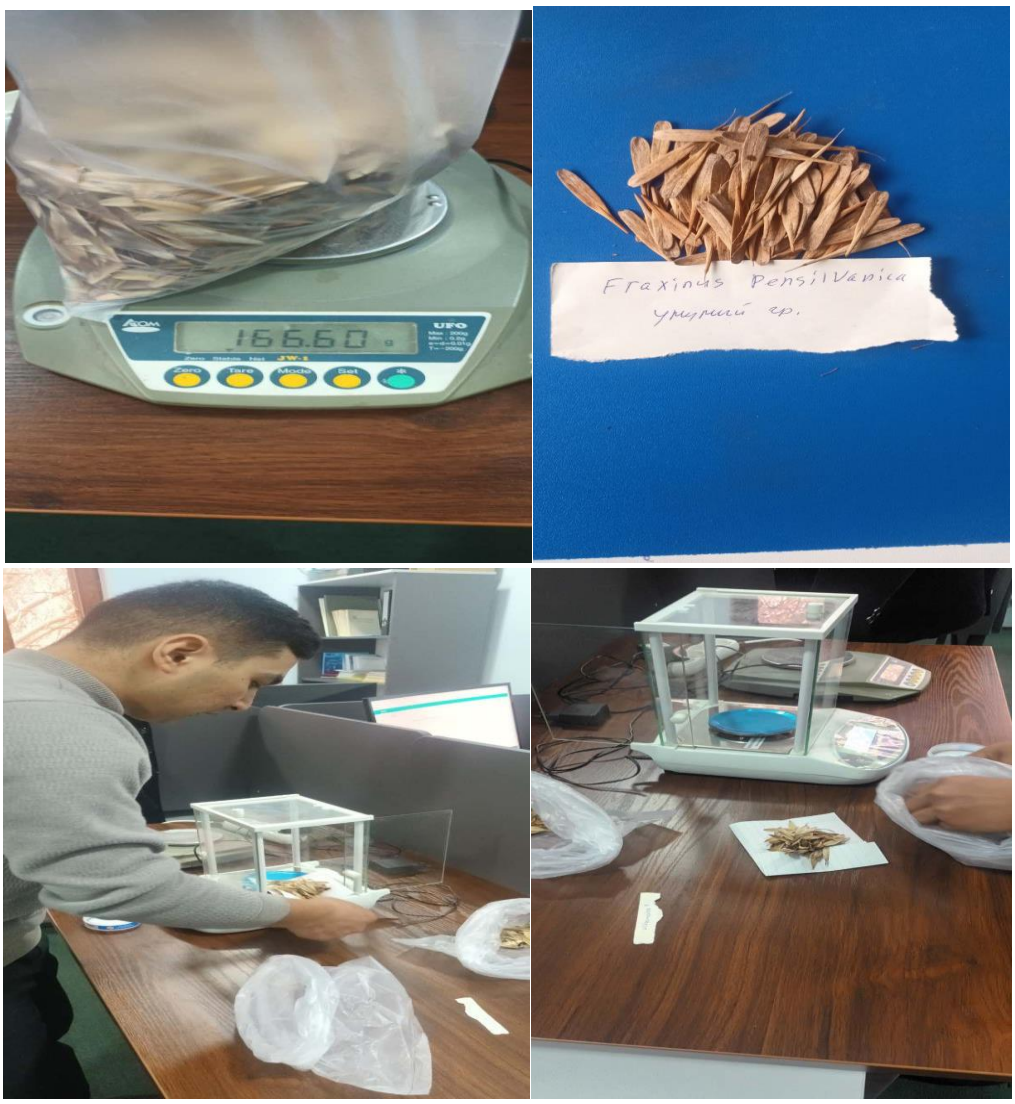

Figure 4. The process of measuring seeds.

In the coming months, research work will be continued on the germination productivity (potential and actual) of Fraxinus pennsylvanica, growth and development of this year's vegetation depending on environmental factors.

Number of seedlings germinated from Fraxinus pennsylvanica seeds
21 in the control (plain water) variant
Kornevin stimulator ta;
16 in Ribav extra stimulant;
26 in heteroauxin stimulator;
It was 10 in succinic acid.

Figure 5. The state of the seeds when they germinate

In the coming months, research work will be continued on the germination productivity (potential and actual) of Fraxinus pennsylvanica, growth and development of this year's vegetation depending on environmental factors.

Number of seedlings germinated from Fraxinus pennsylvanica seeds
21 in the control (plain water) variant
13 on the Kornevin stimulant;
16 in Ribav extra stimulant;
26 in heteroauxin stimulator;
It was 10 in succinic acid.

Results and Discussion

In order to determine the possibilities of vegetative reproduction of maple species, when propagating from cuttings, solutions of different standards are prepared using growth stimulants, and cuttings are placed according to options. On April 5-6 this year, we planted 15-20 cm one-year-old maple

seedlings. We fertilize our planted seedlings throughout the year. The amount and time of fertilizing is determined depending on soil fertility, their physical and chemical properties, and necessary measures are determined. The level of soil nutrient supply is determined depending on the amount of nutrients in the soil, the condition of acids and trace elements. Nitrogen is used for the synthesis of proteins for the basis of life activity of any organism. Growth and development of new leaves, roots, flowers, fruits and other organs depends on sufficient supply of nitrogen to the plant. Ammonium nitrate is well absorbed by plants and has a rapid effect on the growth, development and productivity of various trees in different soils. Phosphorous fertilizers play an important role in the life of plants, phosphorus fertilizers are necessary for all varieties and all soils. It is sprinkled during planting and feeding, because phosphorus is easily retained in the soil and does not wash away in water. Plants need phosphorus directly during flowering and fruiting. Simple superphosphate is well soluble in water and well absorbed by plants. Potassium fertilizers contribute to the rapid growth of the plant, the movement of nutrients in the plant, and the increase of resistance to cold and fungal diseases and other unpleasant conditions.

Two stimulators of root formation were used to accelerate rooting: cornevin and heteroauxin. The experiment considered three options.

1. In the first option, the cut varieties are soaked in a heteroauxin (0.4%) solution for 16 hours, and then planted in the prepared ridges.
2. In the second option, cut cuttings are placed in a cornevin solution before planting.
3. In the third option, cut cuttings were soaked in clean water for 16 hours, and then planted in ridges (control).

As a result of the examination of the level of rooting carried out in the spring, it was determined that the percentage of plants that took root was low.

At the same time, the best rooting results were 31% and 30% when cornevin was used. In the variant that used heteroauxin, it took root better than others - it was 17.6%. For other varieties and variants of the experiment, it was found that the yield of the areas that took root was from 3 to 23%. 60% took root when rooting from cuttings.

It is known that maple grows well with green varieties, so we considered two periods for collecting varieties:

1 period: the third ten days of June - the first ten days of July (the flowering stage and the beginning of flowering);

2 period: the second half of September (the second wave of annual shoot growth).

In the experimental version, green cuttings were planted in a peat-sand mixture (1:1) according to a 3 × 7 cm scheme, the air humidity in the greenhouse was automatically maintained at 90-95% before the start of root formation, the air temperature was about 25-30 ℃ during the day, and about 30 ℃ in the evening. and it was 10-15 °C. Air humidity did not decrease below 80% within 17 days after the beginning of root formation. Based on this experience, the maple breeding technology was developed. One-year seedlings were used when propagating maple (Acer platanoides) seedlings. The irrigation system was carried out twice a week. Seedlings are growing well now. 100% seedlings are growing well. 22 seedlings of 30-35 cm were planted and now they are growing to 50-55 cm.

Shumtol belongs to the olive family and has about 60 species. They are deciduous trees or multi-stemmed shrubs, varying in height from 5 to 45 m, with straight trunks that are highly branched. Small trees or shrubs predominate. The bark of young trees is green, gray or light brown, darkens and cracks

with age. The crown is elongated ovoid, wide round, thick, with relatively rare young branches, the ends of which grow almost vertically. The shoots are bare or hairy, with white lenticels, the buds are dark, often with spots. The leaves are large, pinnate, very rarely entire, without, 3-17 leaflets; leaflets are thin or leathery, dark green above, green or yellowish-green, lighter below. Flowers in terminal or lateral paniculate inflorescences. The fruits hang on the tree almost all winter and are often destroyed by birds. Germination of seeds is 60-80%, lasts two to three years. Photophilous, but tolerates shade when young; often suffers from late spring frosts; grows well in rich, sufficiently moist soils; can tolerate significant dryness of the soil and air. Tolerates strong soil compaction, transplantation, air pollution with dust and smoke. Grows quickly. It begins to bear fruit at the age of 15-20, in forest plantations-much later. It bears fruit abundantly and almost every year. It develops a very strong root system, many roots grow down and to the sides.

Limited to the Northern Hemisphere. Some species of the species belong to tropical forests. According to paleontological excavations, the species was widespread in Europe, Asia and North America during the wet and warm climate during the pre-glacial period. Representatives of the ash genus have a very high ecological plasticity. 10 species of ash grow in Europe, one species in Africa, 16 species in North and Central America. About 50 species of ash grow in Asia. Some species of ash trees are widespread species, while others have a small range. The widest range and the greatest economic value of common ash. In Asia, Manchu ash is widespread and used in various fields

It is necessary to carry out work in the field of landscaping at the level of world standards, for this, a strategy for the development of landscape gardening has been developed in Uzbekistan, and landscape design methods are consistently applied to the field of landscaping.

Table 1 Morphological description of fruits and seeds of maple (Acer platanoides L.).

Selected species	Fruit length, mm	Fruit diameter, mm	Fruit weight, gr	Weight of 100 fruits, gr	Seed length, mm	Seed diameter, mm	Seed output from 1 kg of fruit, gr	1000 seeds weight, gr	Average productivity of a tree, kg
maple leaf maple	9,24± 0,23	5,34± 0,20	0,32± 0,02	36,00	5,10± 0,16	2,19± 0,12	186	18	2,5
Semenov maple	8,03 ±0,21	6,87± 0,17	0,51± 0,02	80,82	4,65± 0,11	3,23± 0,11	101	16	4

Figure 6. Collecting seeds.

Figure 7. Collecting seeds.

Figure 8. A one-year seed is a seedling.

Table 2

Planting and placement of the pen

№	The Latin name of the tree	Pen placement drawing options	Stimulant used in pencil placement	The size of the pen holder, cm	Bud growth (days)	Rooting (day)	Germination (day)
1	*Acer platanoidea*	**Standard**	Control	20-30	50	40	58
2	Acer platanoide*)*	**I**	Carnevin	30-35	35	25	40
3	*Acer platanoides*	**II**	Powder	35-40	40	30	50
4	*Acer platanoides*	**III**	Heteroauxin	20-30	30	25	45
5	*Acer platanoides*	**IV**	Water	30-40	45	35	60

Figure 9. The process of getting a pencil.

Table 3 Planting and placement of the pen

№	The Latin name of the tree	Pen placement drawing options	Stimulant used in pencil placement	The size of the pen holder, cm	Bud growth (days)	Rooting (day)	Germination (day)
1	Acer semenovii	**Standard**	Control	25	55	47	68
2	Acer semenovii	**I**	Carnevin	25	40	31	50
3	Acer semenovii	**II**	wood shavings	25	45	37	55
4	Acer semenovii	**III**	Heteroauxin	25	35	28	48
5	Acer semenovii	**IV**	Water	25	50	39	60

Figure 10. Appearance of pencils.

Table 4 Scale for rating the scenic properties of the maple tree

№	Ornamentation of trees and shrubs Indicators	Maximum score	Placed score
1	Tree height, trunk plane	**6**	**4**
2	The shape of the horn	**6**	**5**
3	The density of the antlers	**6**	**4**
4	The color of the branches	**4**	**5**
5	Seasonal and autumn appearance of leaves	**6**	**5**
6	Appearance during flowering	**20**	**17**
7	Duration of flowering	**16**	**12**
8	Fruit color and appearance	**14**	**12**
9	Long storage of tree fruit	**6**	**5**
10	Keeping the leaves from shedding	**8**	**5**
11	The period of preservation of the decorativeness of the tree	**8**	**6**
	TOTAL:	**100**	**80**

Table 5 Scale for evaluating the scenic properties of the Semenov maple tree

№	Ornamentation of trees and shrubs Indicators	Maximum score	Placed score
1	Tree height, trunk plane	**6**	**4**
2	The shape of the horn	**6**	**4**
3	The density of the antlers	**6**	**4**
4	The color of the branches	**4**	**2**
5	Seasonal and autumn appearance of leaves	**6**	**4**
6	Appearance during flowering	**20**	**16**
7	Duration of flowering	**16**	**14**
8	Fruit color and appearance	**14**	**10**
9	Long storage of tree fruit	**6**	**5**
10	Keeping the leaves from shedding	**8**	**6**
11	The period of preservation of the decorativeness of the tree	**8**	**7**
	TOTAL:	**100**	**78**

Table 6

Growth status of species propagated by spring cuttings (study unit in cm)												
№	Plant name	**Mart**			**Aprel**			**May**			**June**		
		I	**II**	**III**	**I**	**II**	**III**	**I**	**II**	**III**	**I**	**II**	**III**
	Fraxinus pennsylvanica	5	5.5	7	6	5	7	8	9	8.5	0		
	Fraxinus sugdiana	4	6	8	5	5.5	6	6	7	8.5	0		

Having studied the current situation of the problem, the bioecological characteristics of the species of Pennsylvania ash (Fraxinus pennsylvanica Marsh.), which are highly decorative, resistant to diseases and pests, will be studied, and the technology of vegetative and invivo propagation from seeds will be developed. In the conditions of Uzbekistan, creating a scenic area in parks, highways, entertainment places, workplaces, factories and factories, planting the ornamental Pennsylvania ash (Fraxinus pennsylvanica Marsh.) tree species in alleys and other residential areas. Methods of application to landscape design using wiring are developed.

Table 7

Determination of Fraxinus pennsylvanica seed germination indicators using stimulators												
№	Options name	**Mart**		**Aprel**			**May**			**June**		
		I	**II**	**I**	**II**	**III**	**I**	**II**	**III**	**I**	**II**	**III**
1	In the control (plain water) option	14	17	25	29	35	35	35	40	0		
2	Korneven is on the stimulator	12	15	27	31	33	30	32	35	0		
3	Ribav is on extra stimulant	9	13	18	20	25	28	30	35	0		
4	In succinic acid	8	15	20	25	20	20	25	18	0		
5	In boiling water	20	25	20	25	30	25	20	25	0		
6	Seeds in 1 square meter	100	100	95	90	80	80	78	75			

Summary

Plantain maple (Acer platanoides), Semenov maple (Acer semenovii) and Pennsylvania ash (Fraxinus pennsylvanica Marsh.) are promising plants for greening the cities of Uzbekistan. Maple-leaf maple (Acer platanoides), Semenov's maple (Acer semenovii) and Pennsylvania ash (Fraxinus pennsylvanica Marsh.) These decorative forms are recommended for landscaping in all regions of our Republic. Widespread use of this plant in greening is economically effective, besides, it creates conditions for adding more beauty to the environment and corners of our country.

It is considered a plant resistant to harsh continental climate of Uzbekistan.

Today, it is growing and developing well in the conditions of Tashkent city. Maple-leaf maple (Acer platanoides), Semenov maple (Acer semenovii) and Pennsylvania ash (Fraxinus pennsylvanica Marsh.) were rated higher than 80 points in terms of scenic quality, and according to style criteria, they were included in group I, where greening works are promising. It is recommended to use this bush in landscape design, as it is rated as a high decorative species.

The bio-ecological features of the research object were studied and it was found that maple maple (Acer platanoides), Semenov maple (Acer semenovii) and Pennsylvania sedge (Fraxinus pennsylvanica Marsh.) are resistant to cold weather as plants that have passed the introduction conditions. This shrub can be used in bansai art as well as living green walls. This bush can be shaped into different shapes, taking into account its resistance to annual trimming of its branches.

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