

AGROTECHNICS OF CULTIVATION AND USE OF MULBERRY SEEDLINGS FOR PICTURESQUE LANDSCAPING OF HIGHWAYS

Ubaidullaev Farkhod Bakhtiyarullaevich

Tashkent State Agrarian University, Agricultural Sciences

Doctor of Philosophy (PhD), Associate Professor,

Majidov Abdulaziz Norqobilovich,

Master's Degree Student

Khudaybergenov Sardor Kamaraddinovich

Tashkent State Transport University PhD Student

farhodhon.uz@mail.ru

ANNOTATION

Particular attention was paid to research on improving the architectural and landscape system of construction and improvement of roads, identifying highly picturesque, promising plant species that are resistant to various external harmful factors, and developing effective and optimal methods for accelerated reproduction as priority areas. road landscaping areas. In this regard, representatives of the mulberry (*Morus, nigra L*) have a wide decorative potential, the development of fast and effective methods of propagation from seeds and vegetative propagation, the evaluation of the effectiveness of use in landscaping is of great scientific and practical importance.

INTRODUCTION

At the global level, work on landscaping and phytodesign of roads is of great importance, and interest in this area is constantly growing. For this reason, a lot of scientific and practical work is being carried out on the selection of species, varieties and forms of ornamental plants suitable for various climatic and soil conditions. The reason for this is that flora primarily has a great impact on the environment and human health. It is known that the norm of landscaping in the city is 50 m² per 1 population, cities with landscaping of 40-60% are exemplary, and cities with less than 10% vegetation are considered to have a negative environmental situation.

Particular attention was paid to identifying highly picturesque, promising plant species resistant to various external harmful factors and developing effective and optimal methods for their rapid reproduction as priority areas for greening the world's highways. In this regard, new varieties and forms of ornamental species were created, the possibilities of trees and shrubs in modern gardening were assessed, new methods of vegetative reproduction were created, and optimal methods of propagation from seeds were improved. It should be noted that representatives of the mulberry (*Morus, nigra L*) have a wide range of decorative potential, the development of fast and efficient methods of propagation from seeds and vegetative propagation, the evaluation of the effectiveness of use in landscaping is of great scientific and practical importance.

MATERIAL AND RESEARCH METHODS

Field and production experiments, preparation of seed and stem cuttings, determination of seed quality indicators, care of seedlings, calculation of the standard yield of seedlings, selection and evaluation of promising forms 3317-90 (QzDSt 322.15.04.2009). The study and evaluation of mulberry species (*Morus nigra* L) according to scenic characteristics in landscaping roads is carried out according to the method of N.I. Shtonda. The generally accepted criteria for statistical processing of the obtained data are also B.A. Dospekhov is carried out according to the method "Methodology of field experience". When calculating the economic efficiency, the results of the "Example of technological maps for the care of the main crops and the production of products. For 2016-2020 (Part II)" (2015). Carried out according to the reference book "Seedlings of trees and shrubs", 26869-86 (QzDSt 322.15.04.2009). Scientific research is carried out on the basis of the following program. 1. Study of the bioecological features of the mulberry plant (*Morus nigra* L) in the picturesque landscaping of roads in the conditions of Uzbekistan; 2. Improving the technology of vegetative propagation of mulberry plants (*Morus nigra* L) in landscaping roads in Uzbekistan; 3. Improving the technology of using mulberry seedlings (*Morus nigra* L) in landscaping green spaces on highways; 4. Development of technology for the care of seedlings of the mulberry tree (*Morus nigra* L) in landscape gardening of highways; 5. Determination of the economic efficiency of growing mulberry seedlings (*Morus nigra* L) in the landscaping of roads. Phenological observations of I.N. Beideman "Methodology and study of plant phenology", "Vegetative propagation of plants", developed by M. Brouz for the purpose of vegetative propagation of trees and shrubs, assessment of picturesqueness by N.I. Made in the style of a bench. The generally accepted criteria for statistical processing of the obtained data are also B.A. Dospekhov is carried out according to the method "Methodology of field experience". When calculating the economic efficiency, the results of the "Example of technological maps for the care of the main crops and the production of products. For 2016-2020 (Part II)" (2015). Determination of soil and climatic conditions of the place of the experiment. To determine the biological and ecological characteristics of the mulberry (*Morus nigra* L) plant species, their phenological phases are studied, with special attention paid to the periods of flowering. To determine the dynamics of annual growth, the height of the cuttings and the diameter of the root neck are measured every month and entered in a special table. The study of bioecological features of the mulberry plant (*Morus nigra* L) in the landscaping of roads in the conditions of Uzbekistan. The study of the theoretical foundations of the use of mulberry (*Morus nigra* L) species in road landscaping. Scientific literature, foreign literature, dissertations, articles, Internet information and other sources on the topic Libraries, scientific databases Google Scholar and Scopus, Information Resource Center Tosh DAU, Library of the National Research Center for Forestry, Tashkent, Rusanov Botanical Garden Library, Republic Uzbekistan Alisher Navoi Navoi, is studied and compared with its current state. To determine the possibilities of vegetative propagation of the mulberry tree (*Morus nigra* L) when landscaping roads, dividing bushes and propagating by cuttings using growth stimulants, solutions of different norms are prepared and cuttings are placed. by options. In the experiments, a growth stimulator was used, consisting of "4 (indolyl-3-yl) fatty acid" and "24-epibrassinolide" in 3 versions. Distilled water is used as a control.

Selection of varieties of mulberry (*Morus, nigra L*) for landscaping roads, determining the duration of flowering. When landscaping roads, mulberry (*Morus, nigra L*) and its species are selected according to decorative and promising forms according to flower color, flowering duration, flowering duration study, experiment or module numbers. are carried out on selected plant species, and experiments are carried out by the method of modular selection of plant species. Economic efficiency of work. When analyzing the economic efficiency of the work, the importance of the mulberry plant (*Morus, nigra L*) in the landscaping of selected highways was studied. In order to determine the economic efficiency, the maintenance costs for one year are deducted from the proceeds from the sale of mulberry seedlings (*Morus, nigra L*) in road landscaping and the net profit is calculated. The economic efficiency of work is analyzed using tables and charts.

Mulberry seedling care (*Morus, nigra L*)

The main techniques for caring for seedlings are watering, sheltering with umbrellas (if necessary), weeding, loosening the soil and fertilizing. As a result, young shoots grow and develop normally. Watering seedlings is one of the main activities for growing seedlings.

Mulberry (*Morus, nigra L*) is very capricious and requires regular care. If the rules of care are not followed, flowering can be scarce and short-lived. The most important condition for the good growth of mulberry (*Morus, nigra L*) is proper watering. During the growth and flowering period, the soil should always be moist. In autumn and spring it is enough to water once a day, and on hot summer days it is necessary to water twice a day. Toward the end of the growing season, watering is gradually reduced. In winter, it is also required that the soil moisture be moderate, but it should not be allowed to completely dry out. In addition, Indian water needs high-quality soft water without impurities. The water temperature should not be too low. In spring, it is necessary to feed the plant with a fertilizer with a high nitrogen content so that it quickly forms a green mass. Nitrogen top dressing is stopped at the end of August and is not applied in autumn and winter.

Top dressing of mulberry (*Morus, nigra L*) is mainly carried out before the beginning of the growth period and during the flowering period. In the spring, every two weeks, the plant is watered with liquid complex fertilizer, and fertilizing is also carried out before flowering. In order for this bush to be healthy and bloom, several conditions must be met: the old Indian loves sunny places. Before planting mulberry seedlings (*Morus, nigra L*), mix the soil with a little sand. Lagerstroemia is also the most sun-loving plant.

Direct sunlight does not harm it, in shady places it blooms very little or may not bloom at all. In this case, the leaves of the plant crumble. From the moment the first leaf appears until the end of flowering, it is necessary to feed the plant with fertilizer for flowering.



Figure 1. Mulberry seedling care (*Morus, nigra* L) and determination of growth rates

To ensure good growth of seedlings, high agrotechnical processing is necessary. This is mainly important in the nursery department for planting and caring for small one-two-year-old seedlings in order to use seedlings of trees and shrubs in the forest fund to create artificial forests, ecological tree plantations and landscaping, because when high agrotechnical work is carried out here, the construction of artificial tree plantations will be accelerated, planted seedlings will be well preserved, their growth will accelerate, and the resistance of grasses will be low.

The creation of tribal and tribal plots begins with the planning of the land, plowing and preparation of ditches. The earth is plowed to a depth of 35-40 cm. In the presence of saline areas, salt washing is carried out, and then the earth is leveled with a harrow. After that, depending on the type of tree or shrub and for what purposes, seedlings dug out from the seed plot are transplanted in autumn and spring. The distance between planting rows is 0.6-0.7 m, the distance between seedlings is 0.2-0.4 m, or up to 40 thousand seedlings are placed per 1 ha. If the mulberry (*Morus, nigra* L) is planted in a permanent place after 2 years in the care department, the branches will be thick and resistant to various conditions.

Agrotechnical processing of seedlings is carried out depending on the department for the care of seedlings. The plant care department is divided into two parts. On the first site, seedlings are grown from 2 to 5 years, depending on the variety. Saplings of fast and medium fast-growing species of shrubs (*magonia*, *forsythia*, *nasturtium*, *red pyracantha*, *cherry*, *snowberry*, *buddleia*, *cinquefoil*, etc.). In the second part, seedlings of slow-growing broad-leaved shrubs and conifers are grown.

Seedlings of annual shrubs are placed on a plot with a thickness of 0.7x0.2x0.3 or 0.7x0.15 m and watered during the growing season 8-10 times, depending on the conditions.

In the second and third growing areas, the watering rate is 5-6 times, depending on the conditions. Cultivation between rows - loosening the soil in ditches is carried out after 3-4 times watering. Seedlings grown from cuttings are watered 8-12 times a year. It should not be

forgotten that seedlings planted from cuttings should be watered immediately, and processed after 2-3 days.

RESULTS OF RESEARCH

The vegetative propagation of forest tree seedlings is mainly used in years when there were no seeds or when they were harvested in small quantities, and good results can be obtained using this method. Vegetative propagation is the asexual propagation of trees and shrubs, examples of which are propagation by cuttings, propagation by grafting, and propagation by grafting. All properties of the mother plant and signs of its economic value are fully preserved when seedlings are propagated by vegetative means. With this method, the work of growing seedlings is accelerated, moreover, it is not associated with the release of seeds.

Trees and shrubs such as poplar, grapes, willow, plane tree, black currant, fig, pyracantha, cypress, Syrian rose, mahonia, snowberry, forsythia are propagated by cuttings. To do this, annual branches are cut into several pieces and a pack of 100 pieces is buried in moist soil or sand. The cuttings are 20-30 cm long and 0.5-2.0 cm thick. Before planting, they are stored in sandy (8-10 cm) pits or trenches with a moisture content of 60-70%. If prepared pens are placed 0.6x0.20 m, 83 thousand per hectare of land, and 92 thousand per hectare 0.7x0.15 m. In the case of a straight line, the prepared cuttings are planted in a parallel row vertically or at a slight slope, leaving 2-5 cm above the ground, leaving one or two buds. Water immediately after planting and treat after 2-3 days.

Methods have also been developed for growing several types of trees from green shoots (juniper virginiana, spruce, camellia, rose species, Persian rose, Syrian rose). To do this, in May-June, cuttings with 1-2 buds are cut on the one-year-old part of the branch. It is planted in the lower prepared rows so that the branches can take root. They are covered with materials of different thicknesses. Before planting branches, manure, sawdust and river sand are mixed and leveled to a thickness of 2-4 cm. The distance between the branches is 5x4 cm, planted to a depth of 2-3 cm. humidity 90%, and grown in conditions where the temperature does not exceed 30 ° C, green shoots take root within a month. In autumn and winter, they are covered with various straw, shavings, and a film to protect them from the cold. Green shoots that have taken root at koklam are transplanted into a nursery.

One of the most common methods of vegetative propagation is cuttings (Fig. 4.3.1).

Mulberry (*Morus, nigra* L) was vegetatively propagated in the Tashkent Botanical Garden named after Academician F.N. Rusanov. Since mulberry (*Morus, nigra* L) is a plant that has passed the introduction conditions, rooting was studied on 3 seedlings from lignified and semi-lignified cuttings. In the Tashkent Botanical Garden in March-July-September, wooden cuttings of the Indian nastrani bush were harvested. Mulberry cuttings (*Morus, nigra* L) of two different f. *rosea* Nichols - pink, f. *violacea hort.* - selected from magenta forms. The cuttings are 10-15 cm long and come in three sizes: thick, medium and thin. Prepared cuttings were frozen for 15-20 minutes in a mixture of control, root and gummate stimulants. The sand was evenly levelled. For 15-20 minutes, the cuttings thawed in stimulators were nailed to a foggy structure at a slope of 35-400. The cuttings were watered every 2 hours due to the high air temperature. The top of the rain structure is covered with a polyethylene cover. The temperature of the greenhouse was provided at the level of 20-24°C.

Agricultural activities were carried out on time. Weeded, fed, watered. Cuttings are watered 2-3 times a day with rainwater. This is due to the fact that the cuttings require a lot of water in the first days of planting. After 15-20 days, it was noticed that new leaves appeared on the cuttings. Feathers were constantly cared for.

The 1st return has been increased for the spring season. The cuttings were planted on March 2, 2021. Callus formation period: March 14-16, 2021. The length of the first thin branch is 8 cm, the length of the thick branch is 10 cm. Rooting time: observed on May 3, 2019. The length of the main root is 14 cm, the length of the additional root is 8 cm.

The 2nd return was made in the summer. The cuttings were planted on July 18, 2021. Callus formation period: July 29-31, 2021. The length of the first thin branch is 6 cm, the length of the thick branch is 10 cm. The time of release of the root: August 15, 2021. The length of the main root is 6 cm, and the length of the additional root is 12 cm.

The 3rd return has been increased for the fall season. The cuttings were planted on September 17, 2021. Callus formation period: November 15-16. The length of the main root is 5 cm, and the length of the additional root is 9 cm. The planted cuttings were constantly cared for and mineral fertilizers were applied (see Table 1).

Table 1. Planting dates and number of root formation of cuttings of mulberry (*Morus, nigra* L)

№	Mulberry (<i>Morus, nigra</i> L)		Duration			Length and number of roots
			Sowing Period	The period of callus formation	Root length (cm)	Quantity, (pcs)
1	Mulberry (<i>Morus, nigra</i> L)	Control	02.03.22	16.03.22	2-4	1-2
			18.07.22	05.08.22	2-8	2-3
			17.09.22	16.11.22	1-2	1-2
		Kornevin	02.03.22	14.03.22	4-8	3-6
			18.07.22	29.07.22	6-12	4-8
			17.09.22	15.11.22	2-6	2-4
		Gummat	02.03.22	15.03.22	4-8	2-4
			18.07.22	31.07.22	6-10	2-6
			17.09.22	15.11.22	3-5	1-3

Green cuttings of mulberry (*Morus, nigra* L) were harvested by cutting 10-12 cm long. Cuttings of 10-12 cm were planted in the soil at a depth of 5 cm. Cut and prepared cuttings were soaked in clean water for 24 hours. After 1 day, the finished cuttings were dipped into solutions of stimulants and planted at an inclination of 40-45°C to accelerate their growth. Cuttings planted on the 10-12th day form a callus. A month later, the cuttings began to form the main and adventitious roots. The length of the main roots is 14 cm, the length of the adventitious roots is 7-8 cm. The planted cuttings were constantly watered and the air temperature was constantly measured. Grown up and rooted cuttings are planted in the ground without damaging the roots. When transplanting into the ground, they study the condition of the soil. The composition of the soil for the good growth of Indian mustard: clean river sand, hilly earth, humus-rich earth and humus-rich earth in a ratio of 1: 1: 1: 1.

Table 2. Propagation of mulberry (*Morus, nigra L*) by cuttings

Plant title	The name of the stimulator	Concentration, mg/l	Time to keep the pen in the solution minute	Number of pencils		
				General	rooted	%
Rooting from a green cutting						
Mulberry (<i>Morus,</i> <i>nigra L</i>)	Control	pure water	-	40	13±0,29	32
	Kornevin	in powder form	15-20	40	20±0,51	50
	Gummat	in powder form	15-20	40	22±0,60	52

In the Tashkent Botanical Garden in March-July-September, wooden cuttings of the Indian nastrani bush were harvested. The cuttings are divided into three different sizes, 10-15 cm long. The prepared cuttings were frozen for 8-12 hours in a mixture of control, root and gummate stimulants. The sand was evenly levelled. After 8-12 hours, the cuttings heated in stimulators were nailed to the foggy structure at an inclination of 35-40°. The cuttings were watered every two hours due to the high temperature. From above, the foggy structure is closed with a polyethylene lid. The temperature in the greenhouse was maintained at 20-24°C.

DISCUSSION OF THE RESULTS

Mulberry seedlings (*Morus, nigra L*) can be used as an ornamental tree species that is resistant to poisonous gases in the air, drought and cold in landscaping roads. Mulberry (*Morus, nigra L*) can be used for landscaping city streets and avenues, taking into account the climatic conditions of almost all regions of our country.

CONCLUSION

Top dressing of mulberry (*Morus, nigra L*) is mainly carried out before the beginning of the growth period and during the flowering period. In the spring, every two weeks, the plant is watered with liquid complex fertilizer, and fertilizing is also carried out before flowering. It is necessary to observe the health conditions of this bush: mulberry loves sunny places. Before planting mulberry seedlings (*Morus, nigra L*), mix the soil with a little sand. Mulberry (*Morus, nigra L*) is also the most sun-loving plant.

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- ВОҲАСИ УЧУН БАЛАНСИ ВА ЯШИЛ ЭКИНЗОРЛАРИГА ТАВСИЯ ЭТИЛАЁТГАН
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