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PROSPECTS OF INTRODUCTION OF RESOURCE-SAVING METHODS OF PAULOWNIA GROWING TECHNOLOGY IN HILLY LANDS OF NAVOI REGION

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Abstract: In recent years, there has been a tradition of worldwide attention to improving the environmental situation and an ever-increasing demand for building materials and alternative biofuels. Harmonizing both of these situations, that is, the process of technological development and nature protection, improving the ecosystem, focusing on renewable biofuels is the content of this article.

Key words*: paulownia, biofuel, climate, biopellet, drought, regeneration, soil erosion, soil degradation, mineral fertilizers.*

The year 2019, which reached the stage of intensive development in industry, agriculture and other sectors in our country, was declared by the head of the country as "the year of active investments and social development". etc.), the demand for bioresources, especially biofuels, will increase dramatically.

In our country, the local population living in the desert and steppe regions, where natural gas has not reached, cutting down the trees and bushes growing in the desert and steppe conditions as firewood, using their seedlings as fodder for livestock, and the sharp reduction of these areas, as a result of this, is the reason for the degradation of the land. However, trees and shrubs such as saxovul, wormwood, cherkez, and chogon serve as a natural barrier to prevent drought, soil erosion, and desertification. Since a single saxophone tree grows very slowly, it will take many years to restore the cleared land. A number of works are being carried out on the scale of our country for the restoration of lands that have suffered a crisis as a result of anthropogenic factors. But these measures, banning the cutting of plants, including it in the Red Book, did not stop the brutal destruction by the local population.

Comprehensive work on eliminating this negative factor has begun in our country. All industry workers, including scientific organizations, were mobilized in this direction.

On the basis of the decision of August 27, 2020 "On measures to establish fast-growing and industrial paulownia tree plantations in the Republic", based on the soil and climate conditions of our

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country, there is a shortage of water, groundwater below 30 meters, unused reserve areas and water shortage of the forest fund or in saline lands, it is planned to prevent soil degradation by establishing paulownia plantations and to improve these lands, as well as to provide the construction industry of our country with quality building materials. Paulownia is distinguished not only by the fastest growth of trees on the Earth, but also by its amazing beauty and flowering, valuable wood, honey, and biomass source, as well as its strong root system, which decorates parks and avenues as an ornamental tree.

There are many types and varieties of paulownia. We will consider all types, but we will focus more on the types that are the most promising for cultivation in Uzbekistan based on their valuable properties.

- Paulownia catalpifolia - Catalpa paulownia;
- Paulownia elongata - Long paulownia.
- Paulownia fargesii - Farghese Pavlonia.
- Paulownia fortunei HEMSL. - Pavlonia Fartunei.
- Paulownia kawakamii - Kawakami Pavlonia.
- Paulownia tomentosa STEUD. - Fiber paulownia.
- Paulownia Shan Tong - Shang Tong paulownia.

Shang Tong Pavlonia (Paulownia ShanTong) – belongs to 6 climatic zones (-23.5° and -18°C) in terms of frost resistance. Fibrous Pavlonia (P. Tomentosa) and P. Fortuney (P.Fortunei) is a hybrid derived from species. In the Shang Tong hybrid obtained from their cross, cold resistance, fast growth, correct growth of the body, elongated shape of the crown of the tree and beautiful flowering are embodied. Shang Tong type can be grown in all regions of the globe, be it cold or hot. Due to the elongated shape of the crown, a large number of trees can be planted on 1 hectare of land. Shang Tong is currently a paulownia species that is well-suited to plantations for valuable timber, large amounts of biomass, and medicinal honey.

Studying the characteristics of Pavlonia species and varieties allowed us to conclude that the man-made Shang Tong hybrid can be grown as an ornamental tree for greening, which gives quality wood that meets all requirements, obtains a large amount of biomass.

In October 2021, the scientists of the Navoi Department of the Academy of Sciences concluded a cooperation agreement with the "Umrbek" farm in Nurota district on the establishment of a paulownia plantation in the hilly lands of the district, the production of biopellets from the paulownia tree for people living in remote districts, and large-scale work was started.

In 2022, on the basis of the cooperation agreement concluded with "PAULOWNIA BG" LLC in the Republic of Bulgaria, 1,000 units of Eurotechnology based on Eurotechnology will be installed in the "Umrbek" f/x fields of Nurota district in order to start the production of biopellets as a renewable energy source and the production of building materials. Tong hybrid seedlings and 2,000 cuttings of this type of paulownia tree were brought to the 0.4 hectare area.

The brought paulownia seedling cuttings for obtaining construction materials and biomass were planted in a 3x3 scheme based on the agrotechnical requirements set by the European specialists of the field, on the fields specially prepared for organizing the cultivation of paulownia seedlings in the future. One side of the seedlings was covered with a silver-colored special black film brought from the Republic of Bulgaria in order to prevent excessive waterlogging.

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During the period of plant maintenance, the seedlings that started to write leaves in 10 days were cultivated at a depth of 15 cm with the help of motor cultivators in order to control weeds and soften the soil. Plants were watered for the second time with a solution of mineral nutrients at the end of April. During the month of May, it was cultivated once more, fed three times with mineral fertilizers based on an experimental scheme, and irrigation was carried out in the amount of 1.5 m3/ha through the drip irrigation system.

The growth and development of the plant was compared and recorded with plants of the same variety planted in other areas. At the beginning of June, the plant was cleaned from the buds emerging from the leaf axils and re-cultivated against weeds. During cultivation, mineral fertilizers were dissolved in a special container with a capacity of 25 m3 and sent directly to the plant roots through the drip irrigation system according to the experimental scheme. This agrotechnical event was carried out 8 times during the first year of vegetation.

At the end of vegetation (in 4 months), the height of seedlings reached 4.5-5.2 meters in the plot where optimal agrotechnical measures were applied (Table 1).

70% of the planted cuttings have germinated due to the care taken in full compliance with agrotechnical rules, and by the end of the year the treated cuttings have become seedlings suitable for ready planting. These seedlings served as the basis for the establishment of large-scale paulownia plantations in the future with the help of home-grown seedlings, and will provide an opportunity to solve the problem of biopellets and building materials and to acclimatize the paulownia tree to the Shang Tong hybrid.

Table 1

Effect of mineral fertilizer rates on plant height and diameter in hilly areas of Nurota district "Umrbek" F/X with long underground water.

Option	Nutrition NPK kg/ha	Plant height (m)					Stem diameter (cm)				
		May	June	July	August	September	May	June	July	August	September
1	- (control)	0.35-0.40	1.2-1.5	1.7-2.1	2.2-2.7	3.1-3.2	2,4	3,6	4,8	6,7	8,6
2	200/100/70	0.50-0.65	1.8-2.0	2.3-3.5	3.7-4.9	4.5-5.2	3,7	5,6	7,1	9,4	11,6
3	180/75/50	0.45-0.55	1.5-1.8	2.1-2.7	3.2-4.5	4.2-4.9	2,6	4,3	5,6	7,3	9,5
4	150/50/25	0.40-0.45	1.3-1.5	1.7-2.3	2.5-3.2	3.8-4.5	3,1	3,9	5,2	6,8	8,7

The height index of paulownia seedlings planted in the experimental fields of "Umrbek" f/x was 0.35-0.40 m in the observation period after the first germination in the control option until May, and 0.50-0.50 in the 200/100/70 option treated with mineral fertilizers. It was 0.65 m, 0.45-0.55 m in the 180/75/50 version, 0.40-0.45 m in the 150/50/25 version. 3.1-3.2 m in the control option by the end of September of the growing season; 4.5-5.2 m in the 200/100/70 option; 4.2-4.9 m in the 180/75/50 option; It was 3.8-4.5 m in the 150/50/25 option. This, in turn, is 1.4-2.0 compared to the control by the

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end of the growth period, respectively; 1.1-1.7; and indicates that it is 0.7-1.3 meters high.

Similarly, the diameter index of the body in the control from May to the end of September is 2.4; 3.6; 4.8; 6.7; up to 8.6 cm; 1.3, 2.0, 2.3, 2.7, and 3.0 cm in the NPK200/100/70 option, and 0.2, 0.7, 0.8, in the NPK180/75/50 option, respectively 0.6 and 0.9 cm and 0.7, 0.3, 0.4, 0.1 and 0.1 cm higher in the 150/50/25 option (Table 1).

Table 2

Effects of mineral fertilizers on plant growth in the irrigated groundwater areas of Khatirchi district, Navoi region.

Option	Nutrition NPK kg/ha	Plant height (m)					Stem diameter (cm)				
		May	June	July	August	September	May	June	July	August	September
1	- (control)	0.30-0.45	1.2-1.4	1.5-1.7	2.1-2.2	3.0-3.2	2,2	3,5	4,3	5,7	7,3
2	200/100/70	0.40-0.50	1.5-2.0	2.1-2.4	2.9-3.3	3.7-4.2	2,7	4,1	5,6	7,4	10,8
3	180/75/50	0.50-0.65	1.6-2.2	1.9-2.7	2.9-3.4	4.1-4.3	2,5	3,8	4,7	6,4	9,6
4	150/50/25	0.45-0.55	1.5-1.6	1.9-2.1	2.2-3.1	3.1-3.5	2,4	3,6	4,5	6,2	8,2

The height index of paulownia seedlings planted in the irrigated ground water areas of Khatirchi district was 0.30-0.45 m after the initial germination in the observation period until May in the control option, and 0.40 m in the NPK200/100/70 option treated with mineral fertilizers. -0.50 m, 0.50-0.65 m in the NPK180/75/50 option, 0.45-0.55 m in the NPK150/50/25 option. 3.0-3.2 m in the control option by the end of September of the growing season; 3.7-4.2 m in the NPK200/100/70 version; 4.1-4.3 m in NPK180/75/50 option; In the NPK150/50/25 version, it was 3.1-3.5 m. This, in turn, is 0.7-1.0 compared to the control by the end of the growth period; 1.1-1.1; and indicates that it is 0.1-0.3 meters high.

Similarly, the diameter index of the body in the control from May to the end of September is 2.2; 3.5; 4.3; 5.7; up to 7.3 cm; 1.5, 0.6, 1.3, 1.7, and 3.5 cm in NPK200/100/70 option, and 0.3, 0.3, 0.4, in NPK180/75/50 option, respectively 0.7 and 2.3 cm, and 0.2, 0.1, 0.2, 0.5 and 0.9 cm higher in the 150/50/25 option (Table 2).

In conclusion, it can be said that according to the results of the experiment conducted on the study of the effect of mineral fertilizers on the cultivation of paulownia, it was found that the height of trees and the diameter of the trunk were higher in the option fed with NPK 200/100/70 in the experimental fields in both regions.

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