TUT KO‘CHATLARINI PAYVANDLASH ORQALI YOSHARTIRISH VA BARG HOSILDORLIGINI OSHIRISH

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ANNOTATSIYA

Surxondaryo viloyati sharoitida mavjud tutzorlarning ayrim qismida daraxtlarning uzoq yillar davomida parvarish qilinmasligi, novdalarning noto‘g‘ri kesilishi hamda kallaklarning haddan tashqari yo‘g‘onlashib ketishi natijasida barg hosildorligining pasayishi kuzatiladi. Ayniqsa, mahalliy Xasaki tutlarida va yoshi katta daraxtlarda bunday holatlar ko‘proq uchraydi. Shu sababli kam hosilli tut daraxtlarini yoshartirish va ularga yuqori hosildor tut navlarini payvandlash barg hosildorligini oshirishning muhim agrotexnik tadbirlaridan biri hisoblanadi.

АННОТАЦИЯ

В условиях Сурхандарьинской области на части существующих тутовых насаждений наблюдается снижение урожайности листьев вследствие длительного отсутствия ухода за деревьями, неправильной обрезки ветвей и чрезмерного утолщения кроны. Особенно часто такие явления встречаются у местных сортов Хасаки и старовозрастных деревьев. В связи с этим омоложение малопродуктивных тутовых деревьев и прививка на них высокоурожайных сортов являются важными агротехническими мероприятиями по повышению урожайности листьев.

ABSTRACT

Under the conditions of the Surkhandarya region, a decrease in leaf productivity has been observed in some mulberry plantations due to the long-term lack of tree maintenance, improper pruning practices, and excessive thickening of the crown. Such conditions are particularly common in local Khasi mulberry trees and aged plantations. Therefore, rejuvenating low-yielding mulberry trees and grafting them with high-yielding varieties is considered one of the most important agronomic measures for increasing leaf productivity.

Ключевые слова: шелковица, прививка, омоложение, урожайность листьев, сорт Хасаки, тутовые насаждения, агротехника, шелководство.

Kalit so‘zlar: tut, payvandlash, yoshartirish, barg hosildorligi, Xasaki tuti, tutzor, agrotexnika, ipakchilik.

Keywords: mulberry, grafting, rejuvenation, leaf productivity, Khasi mulberry, mulberry plantation, agronomic practices, sericulture.

Introduction. The steadily increasing demand for natural products and fabrics made from natural fibers in the world's developed countries necessitates a significant increase in the production of high-quality natural raw materials that meet the requirements of agriculture, global markets, and industrial enterprises. In this regard, natural products obtained from the mulberry silkworm occupy a leading position in the sericulture industry.

Particular attention is being paid to the rapid development of sericulture in countries with advanced scientific and industrial achievements in the field, such as the People's Republic of China, India, South Korea, Vietnam, and Brazil. In these countries, the production of industrial

products for various sectors of the economy from silkworm larvae, pupae, moths, and cocoons-including food products, perfumes, pharmaceuticals, and natural silk fabrics with high biological and technological value-has become one of the priority areas of development.

Uzbekistan ranks third in the world in the production of raw cocoons after the People's Republic of China and India. In addition to being a highly export-oriented agricultural sector, sericulture plays an important role in providing employment opportunities for rural populations and increasing household incomes.

Mulberry trees cultivated in Uzbekistan belong to the group of perennial trees whose leafy shoots are pruned and utilized annually. Therefore, the timely and proper implementation of agronomic practices, particularly crown formation and rejuvenation, is of great importance. Otherwise, tree growth weakens, leaves become smaller, their nutritional value declines, and overall productivity decreases.

In some mulberry plantations of the Surkhandarya region, leaf productivity has declined due to the long-term neglect of tree maintenance, improper pruning practices, and excessive thickening of the crown. Such conditions are especially common in local Khasi mulberry trees and older plantations. Therefore, rejuvenating low-yielding trees and grafting them with high-yielding mulberry varieties is considered one of the most effective methods for increasing leaf productivity.

In the present study, local Khasi mulberry trees were used as rootstocks. Tajik Seedless, Jarariq-7, Pioneer, and Oshima varieties were selected as scions. In the experimental treatments, Tajik Seedless and Pioneer were grafted using the budding method, whereas Jarariq-7 and Oshima were grafted using the bark grafting method.

Rejuvenation practices were carried out before the onset of sap flow, specifically from the second ten-day period of February to mid-March. Rejuvenation during this period facilitated faster healing of wounds and promoted vigorous development of new shoots.

Initially, in the experimental plots, dried, unproductive, and overlapping branches of Khasi mulberry trees were removed. Trees showing excessive swelling or signs of decay in the crown area were pruned for rejuvenation. As a result, sunlight penetration and air circulation within the canopy improved, stimulating the growth of new shoots.

Among the grafting techniques tested, bark grafting produced the best results. In this method, cuttings containing two to three buds were prepared, their lower ends were cut obliquely, and they were inserted beneath the bark of rejuvenated Khasi mulberry trees. The grafting sites were securely tied with special binding materials. In the budding method, healthy buds of the selected varieties were inserted beneath the bark of the rootstock.

Post-grafting management practices were conducted regularly. Irrigation was applied before grafting and again 7–10 days afterward. When the grafted shoots reached a length of 12–15 cm, excess shoots emerging from the rootstock were removed. During the growing season, inter-row cultivation, weed control, and fertilizer application were carried out.

To stimulate the formation and growth of new shoots on rejuvenated and grafted trees, mineral fertilizers were applied at rates of 120–180 kg/ha nitrogen, 60–90 kg/ha phosphorus, and 30–45 kg/ha potassium, along with 5–10 tons/ha of organic manure. During the first year, phosphorus and potassium fertilizers were primarily used to ensure proper shoot maturation and prevent excessive vegetative growth, while nitrogen fertilizers were applied during the subsequent growing season.

The experimental results demonstrated that the combined application of rejuvenation and grafting significantly improved vegetative growth. The grafted shoots developed vigorously, resulting in increased leaf area and leaf biomass. In particular, trees grafted with Tajik Seedless, Jarariq-7, Pioneer, and Oshima varieties produced higher leaf yields compared with the control Khasi mulberry trees.

Furthermore, the Jarariq-7 and Oshima varieties grafted by the bark grafting method exhibited stronger growth, thicker shoots, and greater leaf productivity than those grafted by the budding method. Nevertheless, the budding technique also showed a high graft success rate and effectively preserved the biological characteristics of the Tajik Seedless and Pioneer varieties.

In conclusion, under the conditions of the Surkhandarya region, rejuvenating old and low-yielding Khasi mulberry trees and grafting them with high-yielding varieties such as Tajik Seedless, Jarariq-7, Pioneer, and Oshima proved to be an effective method for increasing leaf productivity. This approach makes it possible to obtain high-quality leaf yields within a short period, strengthen the silkworm feed base, and significantly improve the productivity of existing mulberry plantations.

Table 1. Rejuvenation of Long-Unproductive Mulberry Trees through Grafting and Improvement of Their Productivity

Grafting Methods and Varieties	Number of Grafts Planted (pcs)			Number of Successful Grafts (pcs)
High-stemmed Tajik Seedless mulberry grafted by the bark grafting method	400	320		80.0
Bush-type Jarariq mulberry grafted by the bark grafting method	400	300	75.0	100
Pioneer mulberry grafted by the cleft grafting method	400	290	72.5	95
Oshima mulberry grafted by the tube grafting method	400	220	55.0	70
Khasi mulberry (Control)	400	230	57.5	72
Grafting Methods and Varieties	Number of Grafts Planted (pcs)	Number of Successful Grafts (pcs)	Graft Survival Rate (%)	Average Length of One-Year Shoots (cm)
High-stemmed Tajik Seedless mulberry grafted by the bark grafting method	400	320	80.0	110

Rejuvenation Efficiency of Different Mulberry Varieties through Grafting

The effectiveness of rejuvenating different mulberry varieties through grafting was investigated in the study. The results demonstrated significant differences depending on the grafting method used and the biological characteristics of the varieties.

To rejuvenate the high-stemmed Tajik Seedless mulberry variety, the bark grafting method was applied to a total of 400 trees. Of these, 320 grafts successfully sprouted, resulting

in a graft survival rate of 80%. By the end of the first growing season, the average shoot length reached 110 cm. These results indicate that this variety is well adapted to grafting under the environmental conditions of the Surkhandarya region and possesses strong growth potential.

For the bush-type Jarariq mulberry variety, the bark grafting method was also applied to 400 trees. As a result, 300 grafts successfully developed, corresponding to a graft survival rate of 75%. The average length of one-year-old shoots reached 100 cm. These findings confirm that the Jarariq variety can be successfully rejuvenated through grafting and is capable of producing vigorous vegetative growth within a short period.

In the high-stemmed Oshima mulberry variety, the tube grafting method was tested. A total of 400 trees were grafted, of which 220 successfully sprouted. The graft survival rate was 55%. At the end of the first growing season, the average shoot length reached 70 cm. This result was lower than those recorded in the other treatments, indicating that the tube grafting method was relatively less effective for the Oshima variety.

For the bush-type Pioneer mulberry variety, the cleft grafting method was used. A total of 400 trees were grafted, and 290 grafts successfully developed. As a result, the graft survival rate reached 72.5%. During the first growing season, the average shoot length reached 95 cm. These results indicate that the Pioneer variety is well suited to the cleft grafting method and exhibits vigorous growth characteristics.

Overall, the experimental results showed that the highest graft survival rate was recorded in the Tajik Seedless variety (80%), followed by Jarariq (75%), Pioneer (72.5%), and Oshima (55%). The average lengths of one-year-old shoots were 110 cm, 100 cm, 95 cm, and 70 cm, respectively.

The obtained results indicate that under the conditions of the Surkhandarya region, rejuvenation of Tajik Seedless and Jarariq mulberry varieties through the bark grafting method is among the most effective approaches. In addition, the cleft grafting method produced favorable results in the Pioneer variety, whereas further improvement of the tube grafting technique is required for the Oshima variety. These findings are supported by the data presented in Table 1.