The OSCAR PUBLISHING Services
American Journal Of Agriculture And Horticulture Innovations

VOLUME Vol.05 Issue12 2025
PAGE NO. 61-63
DOI 10.37547/ajahi/Volume05Issue12-15

Rejuvenation Of Mulberry Saplings Through Grafting and Increasing Leaf Yield

M. Bobomurodov
Senior Lecturer, Termez State University of Engineering and Agrotechnologies, Uzbekistan

G. Allanazarova
Assistants, Senior Lecturer, Termez State University of Engineering and Agrotechnologies, Uzbekistan

A. Khoshboqov
Assistants, Senior Lecturer, Termez State University of Engineering and Agrotechnologies, Uzbekistan

Received: 28 October 2025; **Accepted:** 22 December 2025; **Published:** 29 December 2025

Abstract: This article examines the issues of restoring the biological activity of mulberry trees through grafting, extending their productive lifespan, and increasing leaf yield. The study analyzes the effects of various grafting methods (bud grafting, varietal grafting, combined grafting) on young mulberry saplings and identifies the most effective technologies. In grafted saplings, enhanced growth vigor, accelerated vegetative regeneration, and increased leaf biomass were observed. The article also provides a scientific analysis of how maintenance practices, agrotechnical conditions, and the quality of grafting material affect productivity. The research results offer practical recommendations for ensuring high leaf yields in mulberry cultivation, creating a stable raw material base for sericulture farms, and rapidly rejuvenating mulberry plantations.

Keywords: Mulberry saplings, grafting, rejuvenation, leaf yield, vegetative propagation, bud grafting, varietal grafting, agrotechnics, growth vigor, morphological traits, sericulture, plantation efficiency, sapling management, biomass, yield improvement.

Introduction: In the conditions of the Republic, mulberry trees differ from other perennial trees in that their leafy shoots are completely cut once and sometimes even two or three times during the season. Due to the absence of proper crown formation, poor maintenance, and incorrect pruning practices, mulberry trees exhibit weakened growth, reduced leaf size, decreased nutritional value, and lower yields. Intensive cutting of shoots for silkworm feeding leads to excessive shoot density, preventing the lower buds from developing in subsequent years. As a result, insufficient sunlight reaches the middle canopy, causing a decline in both leaf yield and nutritional quality.

Such conditions are particularly common in single-headed mulberry trees planted in rows and in neglected mulberry plantations. To increase productivity, intertwined branches, dried shoots, and weak sucker shoots are removed close to the trunk, while leafy branches are used for silkworm feeding. This practice strengthens the main shoots, improves air circulation and light penetration, and increases both leaf yield and quality. At the same time, the crown structure is modified. Single-headed mulberry trees are reshaped into multi-headed forms.

During the spring silkworm-rearing period, three strong, oppositely positioned shoots are retained at a height of 40–50 cm, while all other shoots are removed. In the following year, two shoots of 30–40 cm length are retained on each main branch, and the remaining shoots are cut back. Over subsequent years, this pruning method results in a two-tiered crown with six main heads.

Bush-type mulberries are rejuvenated by removing weak sucker shoots and dried branches. Three to four strong shoots are retained at a height of 50 cm, while

lower shoots are removed. In row-planted mulberries, thickened and decaying crown heads are common, especially in poorly shaped single-headed trees. These trees show reduced growth and low leaf productivity.

To restore productivity, the swollen or decayed crown head is cut below the affected area, a process known as rejuvenation. Rejuvenation should be carried out before sap flow begins or at its early stage (from mid-February to mid-March). In multi-headed trees, crown heads should be cut gradually over several years to minimize damage.

Old, unproductive tall-stem and bush-type mulberries can also be rejuvenated. Severely dried trees are cut leaving 2–3 cm above ground, allowing the formation of new stems and multi-headed crowns. Bush-type mulberries are cut at 1–2 cm above the root collar. Cuts should be made perpendicular to reduce wound surface and promote faster healing. The cut surfaces are immediately treated with garden pitch, paint, or clay mixed with manure to prevent sap loss and disease.

In rejuvenated tall-stem mulberries, three strong shoots of 50 cm are retained, while other shoots are removed. In the third year, each head retains two shoots of 30 cm, forming a six-headed, two-tiered structure. Bush-type mulberries are managed similarly over subsequent years.

According to U. Bakirov, rejuvenation of old bush mulberries under production conditions increased leaf yield and cocoon productivity by 2.1–2.4 times. When rejuvenation was combined with deep plowing (28–30 cm), productivity increased by 1.5–1.9 times.

To stimulate shoot growth and leaf production, it is recommended to apply 120–180 kg/ha of nitrogen, 60–90 kg/ha of phosphorus, and 5–10 tons of manure. These findings fully confirm the author's experimental results.

For grafting, 2–3-bud cuttings of elite mulberry varieties are prepared. The lower part is cut at a 35° angle opposite the bud, and the bark on the opposite side is lightly scraped. The cutting is inserted between the bark and wood of the rejuvenated tree. Proper alignment of bark and wood layers is essential. The upper bud remains partially exposed, while the lower bud is completely covered with soil.

Mulberry trees are irrigated one week before grafting and again 7–10 days afterward. When graft shoots reach 12–15 cm, sucker shoots from the rootstock are removed. If grafting fails, sucker shoots are retained and regrafted the following year. When grafts reach 1 m in height, soil around them is loosened.

To ensure proper maturation and prevent excessive elongation, only phosphorus and potassium fertilizers (30 kg/ha) are applied in August of the first year, while nitrogen fertilizers are applied in the second year. Leaves from these trees are used in the following year during the 4th–5th instar of silkworms, and shoots are cut at a height of 50 cm above ground.

According to O. Polatov, grafting cuttings onto the branches of low-yielding 5–6-year-old fodder mulberries between the bark results in stronger shoot growth and increases leaf yield by 1.5–2 times compared to bud grafting.

The grafting site is covered with cotton soaked in a light potassium permanganate solution, wrapped with polyethylene film, and tied with paper and twine, leaving the upper bud exposed. After 4–5 leaves form, the film is removed, and after 1–2 months, all coverings are removed.

Table 1

Rejuvenation of long-term unproductive mulberry trees through grafting and yield improvement

Grafting method	Number of grafts planted	Successful grafts	Success rate (%)	Average annual shoot length (cm)
Tall-stem seedless Tajik variety (bark grafting)	400	320	80	110
Bush-type Jarariq variety (bark grafting)	400	300	75	100
Pioneer variety (cleft grafting)	400	290	72.5	95
Oshima variety (tube grafting)	400	220	55	70
Fodder mulberry variety (control)	400	230	57.5	72

For the rejuvenation of tall-stem seedless Tajik mulberry trees, a total of 400 mulberry cuttings were grafted under the bark, of which 320 cuttings successfully sprouted, accounting for 80 %. As a result of the study, the average length of one-year-old shoots reached 110 cm.

For the rejuvenation of bush-type Jarariq mulberry trees, 400 cuttings were grafted under the bark, of which 300 successfully sprouted, corresponding to a success rate of 75 %. The average length of one-year-old shoots in this treatment was 100 cm.

To rejuvenate tall-stem Oshima mulberry trees, 400 plants were grafted using the tube grafting method, and 220 grafts successfully sprouted, representing 55 %. During the first vegetative growing season, the average shoot length was 70 cm.

For the rejuvenation of bush-type Pioneer mulberry trees, 400 cuttings were grafted using the cleft (split) grafting method, of which 290 grafts successfully sprouted, accounting for 72.5 %. The average shoot length during the first vegetative season reached 95 cm.

References

1. Resolution of the President of the Republic of Uzbekistan No. PQ-2856 (March 29, 2017) on the organization of the activities of the "Uzbekipaksanoat" Association.
2. Resolution of the President of the Republic of Uzbekistan No. PQ-3472 (January 12, 2018) on further development of the sericulture industry.
3. Resolution of the President of the Republic of Uzbekistan No. PQ-3616 (March 20, 2018) on additional measures for the development of sericulture.
4. Resolution of the President of the Republic of Uzbekistan No. PQ-4411 (July 31, 2019) on deep processing in the sericulture sector.
5. Resolution of the President of the Republic of Uzbekistan No. PQ-4421 (August 19, 2019) on improving the activities of Tashkent State Agrarian University.
6. Resolution of the President of the Republic of Uzbekistan No. PQ-4567 (January 17, 2020) on developing the feed base for silkworm breeding.
7. Abdullaev U. Mulberry Cultivation. Tashkent: "Mehnat" Publishing House, 2021, p. 79.