



## **VEGETATIVE PROPAGATION OF ORNAMENTAL PLANTS AND SEEDLING CULTIVATION**

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### **Abstract:**

Seedlings of ornamental plants reproduce rapidly through vegetative methods. Nowadays, vegetative propagation allows for the creation of numerous clones of a single plant. This article provides information on the vegetative propagation of seedlings in ornamental plant nurseries. Vegetative methods (green and lignified cuttings, rootstocks, grafting, and layering) are widely used for propagating trees and shrubs for landscaping purposes. Natural vegetative propagation occurs actively in many trees and shrubs, such as willow, poplar, fir, and others.

**Keywords:** Nursery, ornamental plants, vegetative propagation, grafting, seedling development, genetic uniformity, cuttings, layering.

### **Introduction**

Landscaping works are being carried out in the districts, cities, and state institutions of our republic. In the "Action Strategy for 2017–2021" of the Republic of Uzbekistan, one of the key strategic goals is "...to optimize the crop areas and the composition of crops in agriculture, introduce advanced agro-technologies, and increase productivity..." [2]. Additionally, a decree on "Increasing the level of greenery and ensuring environmental sustainability through the implementation of the national project 'Green Zone'" was issued by the President of the Republic of Uzbekistan (PF-199, 23.11.2023) [1]. According to the decree, at least 50% of the annual budget allocated for the "Green Zone" national project will be directed



towards financing the creation of "green parks" and "public green spaces" through public opinion-based projects such as "My Garden" via the Open Budget portal. Moreover, the significance of trees and shrubs in the national economy is enormous and varied. To properly evaluate the valuable properties of tree species, it is essential to know all their biological, ecological, and physiological characteristics. The aesthetic quality of cities, villages, industrial enterprises, educational institutions, and hospitals is directly related to the surrounding green plant life [3].

### **Main Section**

In the field of landscaping, the propagation of the most common ornamental trees, shrub plants, as well as one- and two-year-old, perennial flowering plants in front of multi-storey buildings and along roadsides, is gaining increasing attention. The vegetative propagation of trees and shrubs in natural conditions refers to the emergence of new shoots from the buds of the roots. In nature, vegetative propagation occurs actively in the following trees and shrubs: willow, poplar, raspberry, and others.

The propagation of plants can be achieved through grafting, seed propagation (for the purpose of grafting), or vegetative methods without grafting. Typically, grafting involves attaching a cutting or a piece of a branch from a cultivated plant to another plant to grow together [5]. There are many types of grafting, which are performed at different times. These include:

1. **Bud Grafting**
2. **Cleft (Scion) Grafting**

By using bud grafting, it is possible to take 100 cuttings with 5–6 buds from one tree and grow 500 genetically identical seedlings. Without separating parts of the parent plant, propagation can occur in the following ways:

- **By Rootstocks**
- **By Layering from the above-ground part of the plant**

There are methods for propagating trees and shrubs by separating parts of the parent plant:

- **Lignified (mature) branches or cuttings**
- **Green cuttings**

The rooting of cuttings occurs based on the regenerative (self-restorative) processes at the basal end of the cutting.



The process of rooting cutting stems can be accelerated by using various growth hormones. The process of polarity can be seen, for example, when roots form at the bottom of the plant's stem, and shoots form at the top, resulting in the development of a new plant's seedling.

When cuttings are planted in soil under normal conditions, their initial development is supported by the nutrients in the cutting itself. However, when planted in artificial substrates, all nutrients accumulate at the basal (lower) part of the cutting, which results in the thickening and formation of larger calluses at the base. This callus helps to seal off the damaged area and promotes the formation of new roots [4].

Cuttings are usually prepared and planted in the spring or fall, depending on the plant species. The cuttings prepared in the spring or taken from the plant in the fall are planted according to the local soil and climatic conditions. Cuttings are typically planted in vertical rows with their upper part (with 2-3 buds) left above the soil surface. Once the cuttings are planted, the surrounding soil is lightly compacted. The rows of cuttings are spaced 12–15 cm apart, with 70–80 cm between the rows, allowing for the placement of 125,000 or more cuttings per hectare of nursery.

Planted cuttings begin to sprout in April, with buds swelling and the first leaves emerging, a process that takes place using the nutrient reserves in the cutting. By the end of April, the stems of the cuttings begin to grow, and 5-7 pairs of leaves form on them. This growth indicates the development of calluses on the cuttings and the formation of their root systems. By early May, cuttings that have not formed roots or have not developed any calluses begin to dry out. By June, the cuttings that have developed their own root systems continue to grow, and by July, some of the seedlings may dry out by 15-20% due to various reasons. The remaining seedlings continue to grow well until the end of the vegetation period, forming standard-sized seedlings [4].

There is not a significant difference in the growth indicators between cuttings planted in the fall and those planted in the spring. However, differences can be observed in the root systems, where those planted in the spring tend to have more developed roots compared to those planted in the fall.



## **Conclusion**

Based on the scientific data reviewed, it can be concluded that vegetatively propagating plant cuttings allows for the creation of clones of the original plant. In other words, if 100 cuttings are prepared with 5-7 buds from the parent plant, it is possible to grow 500-600 genetically identical seedlings. Effective results can be achieved by applying various growth hormones during the rooting process. Additionally, the development of cuttings prepared in both autumn and spring is almost identical, with only slight differences in the root system observed.

## **References**

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