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PROCEDURE FOR PLANTING TREES AND SHRUBS INTRODUCED IN KARAKALPAKSTAN

*Tursunboev Khamdam Eshbaevich*¹

¹ Karakalpak State University named after Berdakh Republic of Uzbekistan

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Abstract

This article examines the characteristics and agronomic requirements for planting introduced trees and shrubs in the Republic of Karakalpakstan. It describes sources of planting material, recommendations for selecting and transporting seedlings, as well as timing and methods of planting, taking into account the climatic conditions of the southern Aral Sea region. Planting technologies for bare-root plants, rootballs, and containers are discussed. It is shown that adherence to agronomic requirements and the correct selection of planting material ensure high survival rates and sustainable development of ornamental plants.

Keywords: plant introduction, landscaping, ornamental trees, shrubs, planting material, agricultural technology, landscape, Karakalpakstan

Introduction

Planting trees and shrubs is a key process in greening populated areas. The quality of these efforts determines the formation of sustainable green spaces and the aesthetic appearance of the urban environment. The use of modern machinery and equipment allows for faster planting and more efficient landscape creation.

In the Republic of Karakalpakstan, landscaping is particularly important due to the arid climate, high continental temperatures, and challenging environmental conditions of the southern Aral Sea region. Therefore, special attention is paid to the correct selection of planting material and compliance with agricultural requirements when planting introduced woody plants. The main sources of

planting material are ornamental plant nurseries and botanical gardens.

An additional source of planting material can be found in suburban forests, city parks, and other areas where trees are thinned. Nurseries grow various types of planting material: 3–5-year-old shrubs for group plantings and hedges, 6–10-year-old trees for single and group plantings, and larger plants used in landscaping.

Materials and Methods

Deciduous planting stock is most often dug from nurseries with bare root systems and planted in the spring or fall. Some species, such as birch, oak, and conifers, are transplanted with the root ball still attached, which ensures better preservation of the root

system. Transplanting trees and shrubs from nurseries to landscaped areas is a complex and stressful process for the plants. Digging inevitably damages part of the root system, especially the small active roots. Therefore, digging up plants must be done with great care, and during transportation, the roots and aboveground parts of the plants must be protected from drying out and mechanical damage.

Transporting plant roots in the open is prohibited. Before loading the seedlings, place a tarp or soft material (straw, sawdust) on the bottom of the vehicle. Trees and shrubs are placed in groups, and the areas where the trunks touch the sides of the vehicle are protected with soft pads. After loading, the plant roots are wrapped in tarps or damp material. If necessary, plants delivered to the planting site are temporarily placed in the shade and covered with tarps. If planting is delayed, the plants are buried in a trench at an angle of approximately 45°, covering the roots with moist soil above the root collar. The timing

of planting woody plants in Karakalpakstan depends on the climate. In most cases, transplanting is done in spring and fall, and in mild winters, from October to April. Conifers are recommended to be transplanted during the period of active root growth – early fall or early spring.

Results and discussion

Experience with landscaping in Karakalpakstan shows that in urban areas, large-sized ornamental tree saplings aged 6–10 years produce the best results. These plants establish themselves more quickly and are less susceptible to damage. To plant trees and shrubs, the locations of the future planting holes are marked out in advance. These markings are made using stakes. Planting holes can be round, square, or rectangular. After excavating the soil, the bottom of the hole is loosened to a depth of 10–12 cm. The size of the planting holes depends on the age and size of the plants (Table 1).

Table 1. Dependence of planting hole volume (and depth) on plant size

Seedlings without soil roots	Diameter, m	Depth, m
When planting in natural fertile soils	0,8	0,7
Soils with low nutrient content requiring additional soil amendments and fertilizers	1,0	Trees
		0,8
When planting in trenches: Single-row green wall Double-row green wall	0,7 0,55 0,8–0,9	Shrubs
		0,6
		0,6
		0,6

Table 2. Pit size depending on root soil volume

Material for packaging a seedling with a lump of earth	Root soil, m Depth, m.			Root soil, m Depth, m.		
	Diameter Circumference Height	Diameter Circumference Height	Diameter Circumference Height	Diameter Circumference Height	Diameter Circumference Height	Diameter Circumference Height
Soft	0,6	–	0,5	1,0	–	0,7
Hard (boxes)	0,8	1,0 × 1,0	0,60	1,5	1,9 × 1,9	0,85 × 0,85
		1,3 × 1,3	0,60		2,2 × 2,2	0,85 × 0,85
		1,5 × 1,5	0,60		2,4 × 2,4	
		1,5 × 1,5	0,65			

When planting seedlings, it is recommended to immerse their root system in a special mixture of soil, clay, and peat. Adding

a 0.001% heteroauxin solution or pre-soaking the roots in water for 24 hours accelerates the formation of new roots and improves plant

survival. When planting, the root collar is positioned 2–3 cm above the soil surface. After backfilling and compacting the soil, it is flush with the ground surface (Table 2).

To create a 1-kilometer-long hedge, approximately 10,000 seedlings are required. Landscaping practice shows that adherence to agricultural requirements plays a crucial role in the successful establishment of introduced woody plants. Reducing the time between digging up the plants and planting them in their permanent location is particularly important. In recent years, new technologies for growing planting material have been actively introduced into landscape construction. One of the most promising is growing plants in containers. This method preserves the root system virtually undamaged and allows for year-round planting, eliminating seasonal planting restrictions.

The ornamental characteristics of different plant groups should also be considered. Fast-growing trees begin to display ornamental qualities 5–6 years after planting, while slow-growing species achieve their maximum ornamental effect only after 10–12 years. Flowering shrubs can acquire their ornamental value in the first or second year after planting. Therefore, when creating new parks and gardens, it is recommended to

plant primarily shrubs and fast-growing trees in the first few years, followed by gradual introduction of slow-growing species. This will create a sustainable and aesthetically pleasing green system.

Conclusion

A study of the planting practices of introduced trees and shrubs in Karakalpakstan revealed that successful plant establishment depends on the correct selection of planting material and strict adherence to agricultural requirements. Particular attention should be paid to preserving the root system during excavation, transportation, and planting. Experience shows that the best results are achieved with large-sized, 6–10-year-old tree seedlings, along with proper preparation of planting holes and the use of stimulating solutions. Modern technologies, such as container growing, allow for extended planting periods and minimize root damage. When planning new parks and gardens, it is recommended to plant fast-growing trees and shrubs first, followed by the introduction of slower-growing species. This approach ensures the development of a sustainable, decorative, and aesthetically pleasing green space in the arid climate of the southern Aral Sea region.

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Contact: arzigull@gmail.com