
RECOMMENDATIONS FOR PLANTING ORNAMENTAL, FRUIT, AND AGRICULTURAL CROPS UNDER THE CONDITIONS OF THE CENTRAL DESERT ZONE OF JONDOR DISTRICT

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In agricultural practice within the world's desert regions, the effective utilisation of halophytes plays a crucial role in restoring degraded desert pastures and selecting and cultivating promising high-protein halophytic species. Under the conditions of global climate change, the rational use of the natural flora of halophytes, their selection based on germplasm, the formation of collections, the evaluation of collection samples, and the selection of shrub, semi-shrub, and herbaceous halophytic ecotypes that are both productive and ecologically resilient, allow for achieving improved fodder quality through the application of high-efficiency cultivation technologies.

In recent times, dust storms have been recorded to occur with increasing frequency across our country. Alongside global climate change, this phenomenon has also been caused by illegal tree felling, water scarcity, and unregulated livestock grazing, which collectively contribute to the degradation of desert pastures. As a result, the diversity of plant species in desert areas has sharply declined. The President of our Republic has emphasised that, under the conditions of a growing population, pastures



represent the nation's largest reserve for ensuring food security. Consequently, the demand for the sustainable use of pasture lands is noted to be increasing every year [1].

In our country, a national target has been set to plant 200 million trees and shrubs annually, aiming to increase green cover to 30 per cent by 2030. While the greenery level stood at 8 per cent in 2020, it has now reached 12 per cent. In the Aral Sea region, green vegetation cover has exceeded 2 million hectares. During the spring of this year, 138 million seedlings were planted, and since the beginning of the year, over 10 thousand hectares of “green belts”, as well as 257 “ministerial” and “regional” gardens, have been established. Starting this year, 2 thousand hectares of land adjacent to roads, rivers, and canals have been leased to 10 thousand citizens and entrepreneurs for planting purposes. Within the framework of the “My Garden” project, 49 billion soums have been allocated from the state budget, enabling the creation of 215 new gardens across local communities.

Jondor district is located in the south-eastern part of the Bukhara region at an altitude of 220 metres above sea level. The amount of precipitation is 125 millimetres, the average temperature in winter reaches -10°C , in summer $+35-40^{\circ}\text{C}$, and in recent years has exceeded $+50^{\circ}\text{C}$. The soils are slightly saline; agriculture is carried out in areas where desalinisation measures are not implemented. These soils belong to the category of newly reclaimed and newly cultivated soils. Their mechanical composition is light, with low to medium stickiness, and the humus content is around 0.4–0.7 per cent. However, due to the presence of calcium carbonate salts in the soil, fine-grained crusts form rapidly after irrigation. Under these soil and climatic conditions, field farming has been developing intensively over the past 50–80 years. In desert and semi-desert regions, fast-growing crops are widespread in nature [2,3].

Ulmus uzbekistanica. A tree growing up to 20–25 metres tall. The trunk is dark brown and branched. The crown is oval-shaped. Leaves are oval or obovate, with an uneven base and double-serrated edges. Flowers are sessile. The calyx is four-parted. The fruit is an obovate samara, 10–15 mm long. It blooms in March, and the fruits ripen in April–May. It is planted in rural and urban areas of Uzbekistan. An endemic species. In rural areas, it is grown for firewood, and in cities as an ornamental plant.

Haloxylon aphyllum (Minkw.). The height reaches 7–10 metres. The trunk is jointed, strongly branched, and covered with dark grey bark; in old trees, the diameter reaches 50–70 cm. Young branches are thin and light grey; one-year shoots are green and succulent. In large trees, branches hang down, forming a compact, rounded crown. Flowers are small, bisexual, cup-shaped, and arranged sequentially in the axils of branches. It flowers from April to June and bears fruit in September [4,5].

It grows in deserts. In particular, it develops well in sandy and sandy-loam grey soils where the groundwater lies at a depth of 5–30 metres, and it is also found along the edges of solonchaks, on saline sands, saline soils, and takyr surfaces.

During the research, studies were conducted on the eco-physiological indicators of drought tolerance and adaptability of saxaul types under arid desert conditions. In the course of experiments, black saxaul, white saxaul, and the Jondor ecotype of saxaul were used as the objects of study. In the research process, certain eco-physiological processes occurring in saxaul species and indicators determining their stress resistance—such as the water retention capacity of the leaves—were determined during their flowering phase.

According to the numerical data obtained, differences were identified between the saxaul types in terms of water loss from the leaves. The highest water loss by the fifth hour was observed in the white saxaul type, whereas the Jondor ecotype showed the lowest water loss and demonstrated a greater ability to retain water within its leaves. In this regard, black saxaul occupied an intermediate position. The observed variations in these indicators among saxaul types were found to be associated with their species characteristics, origin, and biological properties.

Early-flowering forms of saxaul grow faster than late-flowering ones. From September onwards, the intensive development of generative organs resumes, while vegetative buds cease to grow. At this stage, fruit formation begins with the sprouting of generative buds. The seed developing in the central part of the fruit has a red or green colour, which persists until full ripening in the second half of October or early November. At this time, the fruit becomes yellowish or light brown, with a dark brown centre—this colour change indicates the ripening of the seeds.

The fruits of black saxaul are commonly referred to as seeds. Since these fruits usually contain a single seed, they are identical to the seeds themselves. The seeds of black saxaul are nut-like, lysicarpic, single-seeded, and indehiscent fruits. The fruits are attached to the upper part of the five-lobed wing. In mature fruits, this is represented by a five-lobed membranous structure located close to the fruit and covering only its lower part. The wings are thin, transparent, silky, dark brown in colour, and traversed by numerous veins. Together with the perianth, the diameter of the fruit measures 10–13 mm.

Elaeagnus angustifolia L. (Narrow-leaved oleaster). A tree that grows up to 3 metres tall. The trunk is reddish-grey, and the leaves are ovate-elongated or lanceolate, 1.5–5 cm long and 7–20 mm wide. The ends of the branches are often thorny. The young shoots and leaves are covered with fine, silvery, shiny scales. The oleaster blooms in May. The flowers are small, inconspicuous, silvery-white, and have a very pleasant fragrance. The fruits ripen in September–October. They are small, reaching 1–2 cm in length. It grows in floodplain areas on saline soils. The species is highly drought-resistant and suffers almost no damage from hot, dry winds in the south-eastern steppe regions. It is undemanding to soil conditions and grows well even on slightly saline soils.

Morus alba L. (White mulberry). A tree reaching a height of 15–18 metres, forming a wide, spherical crown. The trunk and large branches are covered with grey-brown bark. The mulberry is heat- and salt-tolerant, requires little water, provides good shade, purifies the air, and its fruits are medicinal. The fruits are consumed fresh or dried, and syrup is also produced from them. The wood has traditionally been used for cradle making. Several varieties are known, including the black mulberry, the Balkh mulberry, and local cultivated forms.

For the rapid establishment of planted seedlings such as oleaster, saxaul, mulberry, and elm along roadsides, it is essential to strictly adhere to the required agrotechnical methods. To ensure good development of these seedlings, their water requirements must be fully met. Considering the scarcity of water, soil salinity, and hot dry winds (garmsel), it is advisable to plant tree species with small leaf surfaces. It is necessary to use plant species that consume little water but synthesise a high amount of organic matter, i.e.,

stress-tolerant species. By improving the supply of water and fertilisers, the physiological processes in seedlings—especially photosynthetic productivity—can be enhanced, thereby optimising their metabolic activity.

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