

# METHOD FOR OPTIMIZING SOIL WATER REGIME IN PLANTING PITS FOR GROWING TREE SPECIES WITHOUT IRRIGATION IN SEMI-DESERT CONDITIONS

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The study was carried out at the Kochubey Biosphere Station of the Russian Academy of Sciences on light chestnut saline-brackish soil. The purpose of this work was to identify a possibility of moisture accumulation in the soil (vaporous and atmospheric precipitation) for the cultivation of tree plantations in semi-desert conditions without irrigation. Four species were studied: small-leaved elm (*Ulmus parvifolia*), a hybrid of cherry plum (*Prunus cerasifera*) and peach (*Prunus persica*), tall ailanthus (*Ailanthus Altissima*) and Kazakh poplar (*Populus Kazakh*). It was found that a layer of stone material in the planting pit contributed to the intensification of vaporous moisture condensation and to a greater intake of moisture from atmospheric precipitation into the soil. In total, these sources provided an additional 7.2 to 11.2 mm of productive moisture per day, depending on the climatic conditions of the year, or 48.4% more than in the control without stone material. The method of optimizing the water regime allows for high rates of linear and radial growth as well as for the intensity of sapling growth, and can also be used to create islands of green umbrellas in pastures of semi-desert landscapes located far from artesian wells, due to the lack of conditions for irrigation.

**Keywords:** planting pits, stone material, condensation of moisture vaporous, tree species, lowest moisture capacity, moisture rupture of capillaries, accumulation of productive moisture.