

# Water and Mineral Features of the Substrate and Drought Resistance of Pine Plantations

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Studies of drought resistance plantings of pine carried out on the border of dry steppes and semi-deserts with long-term rainfall is 355 mm/year, evaporation of 720 mm/year for 4 lizimtras models plantings with a volume of substrate 13–15 m<sup>3</sup> and a content of physical clay is from 1 to 40%. The water regime, growth and condition of *Pinus sylvestris* L. forest stand studied in a density of 47–48 thousand/hectares during 7–23 years. The thick cultures pass to the zonal regime of water nutrition from the 3-rd year of life on loose sands. On heavy sandy loam and loam with a thickness of 2,0–2,5 m, the initial reserve of soil moisture ends later by 1,0–1,5 years. The water regime of the substrates is accordingly periodically non-washable and non-washable. Quartz sand with a clay content of about 1% has an adverse silvicultural properties. And with a sufficient moisture supply, the pine growth in height is 1,3, 1,5 and 1,7 on it, and the needles are 1,5–2 times smaller than on coherent sand, sandy loam and loam. With increase in content of physical clay biological efficiency of soil solution quickly increases. On a cohesive – loam substrates pine consume it 2–4 times more economically than on loose sand, in proportion to the increasing number of needles of young and correspondingly reduced its resistance to drought. With age, it increases due to an early multiple decrease in current growth and a 2–3-fold increase in the transpiration activity of needles on poor sands, a decrease in demand for fertility, a reduction in the weight of needles and a decrease in its dynamics in pine forests on clay-rich substrates. The advantage of the stability of dense plantings on loose sand remains for a short time, which may be caused by the rapid aging of forest stands. In this climate for afforestation with pine, the best are single-phase cohesion-soil soils and polymineral sands.