

The markers soils for assessment of capacity of forest lands unproductive

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The article discusses questions concerning the optimization of the structure of the land fund of Ukraine through afforestation unproductive land, which were withdrawn from agricultural use, as well as issues related to the assessment of capacity for forest production of unproductive lands.

In Ukraine the level of arable land is the highest in the world. It reached 78 % in average, in some regions reaching 90 %. At the same time, the efficiency of land use in Ukraine is lower than in Europe in average. The intensive exploitation of agricultural land has led to their degradation. The land degradation Ukraine is associated with intensive and inefficient exploitation of farm lands. The degradation processes associated with the erosion and compaction of soil as well with its salinization and pollution.

One of the most effective tools that contribute reducing the intensity of land degradation is withdrawal from service of degraded and unproductive land and their transformation into the forest and the grassland. The forestation on these the lands requires the applications of detailed studies of soils to determine their suitability for the cultivation of forests.

Ukraine's forests perform different functions of environmental and social (anti-erosion, recreational, etc.) and they are limited in exploitational use. Distributed forests have been divided very uneven. Their distribution far from optimal, in which they would most effectively fulfill their protective functions and provide of the state's a sufficient number of high-quality wood. The largest forest area concentrated in Polesie and Ukrainian Carpathians respectively 26.8 % and 42.0 %, in the forest-steppe -13.0, in Autonomous Republic of Crimea (ARC) - 10.4, in steppe - 5.3%. The total forest cover of Ukraine - 16.1% (this level is one of the lowest of in Europe). Determined that its optimal level should be 20 %.

"Forests of Ukraine" program provides creation of 415 000 ha of forest plantations on lands which were taken out of agricultural use during 2010-2015. Among climatic of zones of Ukraine the greatest volumes of afforestation now being implemented on the Steppe. Among the predominant types of lands that should be afforested are: pastures, stony lands, infertile arable lands, ravines and sand soils.

Pine sylvestris is the main tree species growing on sandy soils. In Ukraine, the most productive pine forests are formed in the Forest zone to sod-podzolic soils. The main part (about 60 % of total area) of sod-podzolic soils the forest zone of Ukraine characterized by a non-significant of podzolization (low and middle level). Pine forests in the Forest-Steppe zone and zone Northern Steppes grow on the lefts banks of the rivers, namely - on second fluvial terrace above floodplain. These terraces are covered with a thick layer of ancient alluvium sandy composition. Pine forests almost universally have an artificial origin. They are formed on the soddys podzolized soils of clay- sandy composition.

There was defined system of indicators for estimating forest growth potential of sandy and rocky soils in Ukraine (on 136 plots in different climatic zones of the flat part of Ukraine) made on the basis of mathematical processing of research results. A system of indicators for soil sandy includes: granulometric composition (the content of physical clay - particles $< 0,01$ mm), the depth of humic horizon (cm) and the content of total potassium. Increasing content indicators of these soils contributes for increasing height (quality class) pine stands. Should be noted that the clay particles content in the sandy soil largely determines the soil's depth profile and the concentration of total potassium. The depth of the soil profile is a particularly important diagnostic indicator. It allows to assess silvicultural potential of soils at the stage of full-scale of the study.

In the steppe region of Ukraine in large volumes under the afforestation transmitted the underdeveloped soils on limestones dense. Objects of our research are underdeveloped soils on limestones dense (southern calcareous chernozems, sod-calcareous soils, lands under recultivation after limestone mining), that are transmitted for afforestation in the steppe Crimea. The control groups consisted of underdeveloped southern black soils on hard calcareous limestone rocks which are under protective forest plantations. These lands previously used as pasture or arable land.

Determined that total capacity of the soil profile (cm) is the most informative marker of suitability for afforestation of the underdeveloped soils on limestones dense. Determined that in dry climates the depth of soil < 30 cm this limit value for its suitability for afforestation. The soils underdeveloped on limestones dense without their reclamation (deep plowing with the destruction of dense rock, the filling layer of soil from above) for afforestation is unsuitable. The depth of soil > 30 cm could be regarded as the beginning of increasing level their suitability for afforestation. Such lands are suitable for growing drought-resistant trees. For example, the arboreal species such as the *Gleditsia triacanthos*, *Ulmus parvifolia*, *Fraxinus lanceolata*.

The research for determination of soils suitability for afforestation should be conducted on the principles of forest typology, because only in this case it is possible to create new forest plantations which would be resistant to adverse factors of environment.

Keywords: capacity for forest production of lands unproductive, afforestation, markers of soils.