

**СЕКЦІЯ 2. «АКТУАЛЬНІ ПРОБЛЕМИ ЛІСОВІДНОВЛЕННЯ,
ЛІСОРОЗВЕДЕННЯ, ЛІСОВИХ МЕЛІОРАЦІЙ»**

**SOUTHERN LEFT-BANK UKRAINE FOREST-STEPPE
FRESH PINE FOREST PHYTOMASS**

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In the south of the forest-steppe zone of Ukraine, the biological performance of artificial forests has not been sufficiently studied. Our research was conducted in the most widespread and economically valuable type of pine forest – in a fresh pine forest (sand terrace of the Siverskyi Donets River, within the territory of the Skrypaiv forest farm, the Kharkiv region).

The soil under the studied tree plants is sod, developed (or poorly developed), silty, clay-sand on ancient alluvial quartz sand. Thin loamy layers (pseudofibers) are usually at a depth of 0.5 to 1.0 m. The relief is slightly undulating, groundwater lies at a depth of more than 10 m and does not affect vegetation. The living above-ground cover is dominated by ground reed grass, sedge (ground and heathered), kupena medicinal, hawkweed (umbrella and blue-like), and others. In 80-100-year-old plantations, green mosses such as *Dicranum wavy* and *Pleurosium Shrebra* are widespread.

The upper layer (0-18 cm) is characterized by the accumulation of humus (up to 1.4%) and exchangeable-absorbed bases (7.9 mg-eq/100 g of soil). The soil reaction is acidic (the pH of the saline extract is 4.4). Fine particles (less than 0.001 mm) up to 4%, with the depth of their number in pseudofibers increases.

Plantings' phytomass record was carried out according to current methodical recommendations. Above-ground mass of tree plants is determined by five average model trees, underground – by average trees of the central class and the two extremes of the five thickness classes; the weight of the bark of the trunk (branches) in the bark and the weight ratio of the bark and wood, calculated from individual cuttings (sections of branches). The accuracy of determining the mass fractions of model trees does not exceed 10-15%. The current weight gain of wood and bark of the trunk is determined by the percentage of the current volume growth of the trunk without bark, considering the weight of wood and bark, assuming equality of relative weight and volume gains.

The average growth of branches is calculated by dividing the mass of branches from two-meter trunk stumps by the average age of these branches: it is equal to half the sum of the annual rings on the lower and upper sections. The

average growth of tree roots is calculated as a percentage of the average growth of phytomass in the aerial part.

The total stock of phytomass in 26- to 100-year-old pine forests increases from 854 to 2090 t/ha. The above-ground phytomass of the living part is 814 t/ha in 26-year-old young trees, 1548, 2062, and 2061 t/ha in 50-, 80-, and 100-year-old stands, respectively. In the dead part of the above-ground phytomass, dead branches prevail, and at the age of the most intensive growth (26 years), the mass of dead branches is the highest – 39 c/ha. With age, the mass of the trunk part increases sharply: from 711 t/ha in a 26-year-old to 1930 t/ha in a 100-year-old. There are no significant changes in the reserves of total phytomass of crowns of 26-80 summer pines: the difference does not exceed 15%. In a 100-year-old pine tree, the mass of the crown is 27% higher, which is explained by its lower fullness and the relative increase in the growth of knots characteristic of this age. The mass of knots (unbranched branches) per 1 ha in 26-, 50-, 80- and 100-year-old plantations is 44.0, 40.1, 25.4, and 29.0 c/ha, respectively, which indicates a gradual decline in the accumulation of needles in plantations older than 26 years.

The studied tree plants are characterized by a relatively weak development of the crowns and a high share of trunk wood, which should be explained by the complex effect on the phytomass structure of edapho-climatic conditions and the completeness of the tree plant. The average percentage of the bark of trunks and branches in the total weight is 13 and 37 in a 26-year-old pine forest, 8 and 36 in a 50-year-old, 6 and 35 in an 80-year-old, and 7 and 30 in a 100-year-old one.

The root system of the studied tree plants mainly has a branched system of vertical roots while rod-type roots are less common. In thick pseudofibers, abundant horizontal branches usually depart from the tap roots, which are clearly visible in 50-year-old pines and strongly developed in 100-year-old pines. Vertical and tap roots of 80-100-year-old trees of the I-II growth classes often end with bundles of small roots in the form of brooms.

The share of root growth in the total growth of the grass cover of 26-100-year-old plantations increases from 42 to 62%, which is explained by the strong development of the rhizomatous plant – ground reed grass (from 15 to 67% of the total growth of the above-ground phytomass of grasses). The share of moss growth in the total mass of living cover growth of 80- and 100-year-old plantations is 47 and 27%, respectively. The growth of oak undergrowth in a 100-year-old plantation is 86 kg/ha, including leaves – 46 kg, shoots – 6, branches – 9, trunks – 8, and roots – 17 kg.

The tree layer produces 99-78% of the total mass of organic matter. The lower layer in 26-50-year-old plantations form 1-2%, and in 80-100-year-old plantations 10-22% of the total mass of annual production.