

BIOTIC PRODUCTIVITY OF UKRAINIAN FORESTS IN EUROPEAN ECORESOURCE DIMENSION

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Geographical position of Ukraine on the map of Europe brings up the interest of scientists and politicians in biotic potential of its forests from the point of view of securing energy needs of the society with renewable sources and ecological stability of the environment due to global climate changes.

The state forest account as of 1.01.2011 shows that Ukrainian forests cover an area of 9573,9 thou. ha, which secures share of forest covered land on the level of 15,9%. Forest share in Ukraine is lower than in majority of European countries. The forests are distributed very unevenly across the country regions. One of the peculiarities of Ukrainian forests is their multi departmental subordination. Total growing stock of Ukrainian forests is around 2,1 mio. m³, while mean growing stock per 1 ha of forested land is 220 m³, which is close to indices of many European countries.

The methodological basis for the research is formed by technique for collection and processing of research data, which involves establishing temporary sample plots where field research data is collected: model trees are felled and processed fraction-wise. Laboratory research of the collected samples follow the described sequence. For correct biometrical processing of the field research data, the system of special applied programs is used. Net primary production (NPP) of forest ecosystems is computed by original method, which eliminates systematic errors. The main theoretical groundings and practical methods of the methodology were successfully approbated in the International Institute for Applied System Analysis and realized in several joint international projects.

According to the main findings of the research, forests of Ukraine show a

positive trend of live biomass accumulation: its stock increased by 17,8% over the past 10 years. This trend proves positive impact of forestry upon the environment and resource potential of the industry branch. Ukrainian forests also have significant density of sequestered carbon ($7,9 \text{ kg} \cdot \text{C} \cdot \text{m}^{-2}$), which is higher than in many European countries.

Nearly 48% of live biomass is concentrated in hardwood broadleaved stands, 43,4% – in coniferous stands, and 8,8% – in softwood broadleaved stands. The share of young stands is 9,9%, over a half of live biomass of Ukrainian forests is located in mid-aged stands (51,2%), percentage of immature, mature and overmature stands is equal 20,8; 13,7 and 4,4% respectively.

Total stock of dead wood in Ukrainian forests is 92,6 mio. m^3 with density of $9,7 \text{ m}^3 \cdot \text{ha}^{-1}$. Stock of fallen dead wood is 74,5 mio. m^3 , its density is $7,8 \text{ m}^3 \cdot \text{ha}^{-1}$. Total density of dead organic matter in Ukrainian forests is $17,5 \text{ m}^3 \cdot \text{ha}^{-1}$. Carbon pool of dead wood on forest covered land exceeds 26 mio. tons, while carbon in standing dead wood and fallen dead wood makes up 3,5% from total carbon accumulated in live biomass.

NPP of Ukrainian forests is quite high – 49,0 mio. tons $\text{C} \cdot \text{year}^{-1}$, or on average – $512 \text{ g C} \cdot \text{m}^{-2} \cdot \text{year}^{-1}$. This is higher than in Boreal forests of Europe ($460 \text{ g C} \cdot \text{m}^{-2} \cdot \text{year}^{-1}$). Distribution of NPP by live biomass fractions is typical for forests of temperate zone. High share of NPP is located in leaves or needles (24,1%) and belowground live biomass (31,0%), mainly due to fine roots. Another location of high share of NPP is live ground cover (13,5%), and undercanopy vegetation (4,9%).

Comparison of bioproductivity indices of Ukrainian forests with corresponding parameters of forests of some European countries proved substantial ecoresource potential of Ukraine, which can help ecological stabilization of the environment and climate change mitigation.