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FORECAST OF CARBON SINK AND OXYGEN-PRODUCTION OF BLACK ALDER STANDS OF UKRAINIAN POLISSYA

P.I. Lakyda, V.I. Blyshchyk

National University of Life and Environmental Science of Ukraine

Black alder is a part of the most common deciduous tree species of the study area. This is due to the peculiarity of the forests in Polissya – its marshiness, which very much influences the stand composition and productivity. Black alder can easily be considered of great importance in forestry because of its adaptation to climatic and soil conditions, rapid growth, easy coenose reproduction, soil improving capacity and valuable timber.

Forest ecosystems of Polissya region is an important stabilizing element in the natural landscape of Ukraine. They have a positive impact on the hydrological and climatic regimes, soil formation, flora and fauna. Despite the spread and specific growth conditions of alder stands, an urgent task is to assess their ecological functions (carbon accumulation and oxygen evolution).

The volumes of deposited carbon calculated by the total live biomass production is much higher than the value of this index calculated by the actual live biomass.

Stem wood is economically valuable component of live biomass in terms of forestry production, and it is also an important carbon dioxide storage from the standpoint of the bioproduction process. The share of stem wood varies from 47 to 76% in I^a site index and from 36 to 64% in IV site index in the total volume of deposited carbon by the actual live biomass. That is, it increases with age and decreases with the reduction of site index. However, the contribution of stem component in the total volumes of deposited carbon by the total live biomass production is significantly less (16–40%) and a completely different character of changes (decreases with age and site index).

Oxygen-production of studied forest increases with age, because they accumulate growing stock and green mass of trees in the process of natural development. As deposited carbon and oxygen-production of black alder forests calculated by the total live biomass production is significantly higher than the value of this index calculated by the actual live biomass.

The amount of oxygen evolution and the total carbon sink of alder forests was calculated based on the distribution of forest areas of studied stands by age classes from the relational database «Stand-wise mensurational characteristics of forest» of Production Association «Ukrderzhlisproekt» as well as a obtained tables for evaluation of carbon-sequestering and oxygen-producing functions of alder stands. Thus, in 01.01.2011 black alder stands of vegetative origin in Ukrainian Polissya has accumulated 2.5 million tons of carbon and allocated 7.1 million tons of oxygen in the actual growing stock.

Evaluation of carbon sequestion and oxygen-production functions of black alder stands of vegetative origin in Ukrainian Polissya was carried out based on yield tables for modal stands and models of bioproductivity of forest stands by live biomass components.