

Streszczenie pracy w języku angielskim.

The aim of the study was to analyze the relationship between the volume increment of oak stands and the selected features of stands sites, and to examine the factors that influence the production potential of forest habitats for oak. Material consisted of data from 150 sample plots established in oak stands Upland Malopolska.

Based on the conducted analysis, it was found that the potential site productivity for oak mainly depends on the physico-chemical properties of the soil, the soil type and the type of geology that explain 68% of the variability of grading. The use of topographic variables increased the proportion of variance explained to 77%. Site index for oak shows a strong trend of age indicating the occurrence of changes in the site productivity of the study area for oak caused by changes in site conditions that are most likely caused by nitrogen deposition and changes in some climate parameters. The observed age trend indicates an increase in site productivity for oak and the associated growing potential of oak forest ecosystems. Volume increment of oak stands is strongly correlated with the characteristics of the stand and especially the density expressed by the stand density index SDI, stand volume, stand age and site index. The use of these variables in the model allowed to 80,7 % of variance in the case of 5-year growth and 84.3% for 10-year growth. Addition to the commonly used models of growth traits stand to increase the accuracy of determining the increment can be achieved by adjusting the models to the local growth conditions by using as explanatory variables the subtype and selected soil properties and type of geological substrate. In the case that features stand outside in the model we use incremental content in soil nitrogen and part sand and a subtype of the type of soil and geological substrate part of variance explained by the model incrementally increased to 85% for the five-year growth and 88% growth for ten years. High accuracy of the determination of the site index and volume increment using models based on the stand and site characteristics allows them to be used in the practice of forestry. Site prediction models based on environment variables can be successfully used to for predicting the productivity of newly introduced species in forest areas, where it is planned to change the species composition and in non-forest areas.