

**STRUCTURE OF THE DIAMETER OF DIFFERENT AGES
OVERGROWTH BEECH STANDS UKRAINIAN CARPATHIAN.**

S. I. Haychuk, O. A. Girs

Forest structure studies are of a great importance for the development of forest inventory regulations.

Analysis of data revealed the difference in the structure of European beech *Fagus sylvatica* L. overmature stands. Based on the stem volume of younger generations, analyzed stands can be divided into types: i) even-aged – without clearly distinct second storey; ii) relatively even-aged – with the 10% of volume share of younger generations; iii) uneven-aged – with more than 10% of volume share of younger generations.

Research data consists of tree stands from all three types (33%, 36% and 32% of the total tree stands amount respectively). During the cruising of uneven-aged stands, average diameters may vary considerably, e.g., the average diameter of tree stand is 36 cm, while for the first storey it is 48 cm, and for the second – 12 cm.

The statistical analyses of our research data accompanied with the results of previous researches in this field of study (O.A. Hirs) showed that the most accurate results are obtained using β -distribution.

It was found that overmature beech stands of the Carpathian region are characterized with two-storyed structure and presence of younger trees. Structure indices of both first and second storeys, as well as overall combined stand structure indices are characterized with different parameters.

Skewness and kurtosis indices decrease after the storey differentiation in the stand structure. Yes, skewness of overall combined stands varies from -0,28 to +2,93 (in average +0,47), while skewness of the first storey varies from -0,25 to +1,91 (in average +0,46); kurtosis of overall combined stands varies from -1,29 to +9,35 (in average +0,37), while kurtosis of the first storey varies from -1,29 to +6,54 (in average -0,16).

Analyses of research data showed that second storey with the 10% volume share is present in overmature stands with average diameter from 20 to 44 cm.

In the range of average diameter from 48 to 68 cm second storey has 1-6% of total stand volume.

Mathematical modelling was conducted separately for different storeys and whole stand. It was used in order to retrieve data needed for further creation of diameter distribution tables. Such indices as variability, minimal and maximal reduction numbers, share of merchantable stems were modeled based on average diameter of the stand. Correlation indices between diameter variability of merchantable and overall stems were modeled based on the share of merchantable trees in the stand.

Both diameter distribution of the whole stand and diameter distribution of the second storey were calculated using program developed by the Department of Forest Inventory and Forest Management of National University of Life and Environmental Sciences of Ukraine.

Dependence of second storey average diameter from average diameter of the whole stand was revealed on the basis of correlation coefficients between diameter distributions of the first and second storey. Besides that, mathematical model of second storey stem volume dependence from the overall combined stand average diameter was also created. Diameter distribution of each storey was calculated using conversion coefficients and age class distribution data.

Overmature beech tree stands, stand inventory within different storeys, age classes of tree stands.