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The Principal Characteristics of the Trees Studied in a Comparative Culture of Beech in the Apuseni Mountains, Romania

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SUMMARY

The biological material represented of 31 provenances of beech (*Fagus sylvatica* L.) has been analyzed in a comparative culture of descendents in Aleşd, Poiana Florilor, Bihor, Romania. The study material was representative for 17 European countries, from almost the entire natural area of the specie, including Romania. The seedling plants used in the setting up of the culture were two years old and came from the nursery of the Institute of Forest Genetics Schalembeck, Germany. The culture's area of settlement was in the G2 zone, the Apuseni Mountains (Pădurea Craiului Mountains), subzone G240-hilly beech woods, while the experimental appliance for the culture was a 3x4 rectangular railing, with three repetitions, completely randomized, each unitary lot covering 10x10 m, and being made up of 50 plants placed on five rows with a 2 meter distancing in between and 1 meter distance within the row. The study was performed 5 years after planting, and following peculiarities were analysed: percent of survival of the trees (%), total height of the trees (cm), base diameter (cm) and forking (indices). The values measured in percents were transformed in arc sin $\sqrt{x}$, the experimental data for all traits being processed statistical. The inheritance was defined as the rate of genetic variance in relation to the phenotypic variation from the beech comparative culture. The heritability coefficients were computed for different traits, as total height of trees, diameter at the base and forking. Some traits had a quite strong genetic control: for the diameter at the base, the genetic component represented 48% of the total phenotypic variation, the difference being under the environmental influence. Another trait with a strong genetic control was forking, which was 45% controlled by genotype. The total height of the trees had a very weak genetically control, being influenced almost 100% by the environment, the genotype participation being insignificant to the phenotypic variation. Thus, the calculation of the heritability coefficients for principal traits of the trees is important for establish the genetically control of the traits. Also, it allows the calculation of the genetic gain, useful when these provenances of beech are used as reproductive forest materials.

Keywords: survival, forking, heritage, genotype, genetic gain

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