

THE HERITAGE CHARACTERS IN COMPARATIVE CULTURE OF ORIGIN BEECH BAIA SPRIE-CĂRBUNARU-MARAMUREȘ

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Abstract

Everywhere the immeasurable wealth of the intraspecific genetic diversity of species from the European continent and Romania is linked to very often high of the parking areas with very different conditions. Therefore, the rational use of the forest reproductive material genetically improved has a great importance to forestry, especially for wood production and resistance to adversity (adaptability).

Keywords: survival, forking, provenance, the heritage, adversity

INTRODUCTION

One of the imperatives of science and current practice is to know the genetic identity of forest reproductive material used in cultures, which are determined for now through knowing of the provenance and the phenotypic population's value of provenance.

The rational use of genetically improved forest reproductive material has a great importance to forestry, especially for wood production and resistance to adversity (Enescu, Cherecheș, Bândiu, 1997; Hazler et al., 1997).

The beech, an indigenous species with a high economic and environmental value will be focus on improving forest species, which is fully justified in view of the major objectives of improvement to be put before the breeders of this species: increased of stability, quality and productivity of beech forests and its resistance to adversity.

MATERIALS AND METHODS

The biological material consists of 26 origins of beech (*Fagus sylvatica* L.) has been analyzed in comparative culture of descendent from Aleșd-Poiana Florilor-Bihor installed (table 1).

The study material was representative for 8 European countries, from almost the entire natural area of the species, 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 in Schalembeck, Germany.

Table 1

The beech provenances (*Fagus sylvatica* L.) tested in comparative culture
Baia Sprie-Cărbunaru-Maramureș

Provenance No.	Country	Provenance	Latitude (N)	Longitude (E)	Altitude (m)
11	Franta	F.D. des Charmettes	45°15'	03°00'	-
18	Franta	F.D. de Ligny en Barrois	48°37'	05°16'	300
23	Franta	F.D. de Villafans	48°15'	07°15'	-
26	Danemarca	Glorup	-	-	-
28	Suedia	Ryssberget	56°05'	14°36'	90
36	Germania	Osterholz-Scharembek	53°17'	10°28'	28
40	Germania	Borenden	51°30'	09°50'	375
44	Germania	Oberhaus	51°70'	10°50'	9
51	Germania	Eitorf 1502/2629	50°30'	07°30'	305
66	Germania	Dillenburg	50°44'	08°02'	500
69	Germania	Büdingen Abt. 762*	50°17'	09°07'	198
73	Germania	Sinntal Abt. 414*	50°19'	09°38'	465
77	Germania	Eisenach	50°59'	10°19'	-
80	Germania	Ebeleben	51°17'	10°45'	-
92	Germania	Elmstern-Sii Appenthal	51°30'	09°50'	375
93	Germania	Montabaur	49°50'	08°00'	313
94	Germania	Etteiben	48°12'	07°55'	445
99	Germania	Ehingen	48°24'	09°30'	620
104	Germania	Zwiesel	49°01'	13°14'	755
129	Slovakia	Smolenice	48°22'	17°22'	420
130	Slovakia	Trenčín	48°58'	18°01'	510
135	Slovakia	Medzilaborce-Koskovce	49°17'	21°50'	-
137	Slovenia	Postojna	45°45'	14°19'	1100
144	Ucraina	Rachiv	-	-	-
150	România	Sovata (25)	46°35'	25°00'	1015
PL	România	Cărbunaru	47°35'	24°04'	640

* - standard, PL – local provenance

The culture's area of settlement was in the H2 zone – The Ciceului Hills, with a cold and wet climate where the biggest area is represented by the beech hills, subareas H 240-Beech hills - main area species: beech, altitude range 500-700 m, 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 (Ienciu, Savatti, 2004; Ienciu, 2007).

For each analysed characters there were calculated the main statistical parameters: the medium, the standard deviation, minimum and maximum values, the amplitude variation, variance and variance coefficient (Ceapoiu, 1968; Konnert et al., 2000). The facts' analyse was performed after the STATISTICA program (Compleat Statistical System, StatSoft, Inc., 1991).

RESULTS AND DISCUSSION

Measuring and observations were performed 5 years after planting and the following features were taken into account: survival (%), total height (cm), base diameter (cm) and forking (indices). The values measured in percents were transformed in $\arcsin \sqrt{x}$, the rest of the results being processed by means of statistical mathematics (Lazăr, 2008; Lazăr, Bandici, Popoviciu, 2008).

It was estimated that heritage in the narrow objective is defined as the rate of genetic variance in relation to the phenotypic variation from the beech comparative culture

from Baia Sprie-Cărbunaru-Maramureș. Also were calculated the heritage coefficients for different characters as: total height, diameter at the base and forking (table 2).

Table 2

The heritage (h^2) of some characters in comparative culture beech provenances
Baia Sprie-Cărbunaru-Maramureș

No.	Character	h^2
1.	Total height	0.01
2.	Base diameter	0.48
3.	Forking	0.45

Some characters have a quite strong genetic control, namely: for the diameter at the base the genetic component represents 48% of the total phenotypic variation, the difference till 100% being the organic component, respectively the environmental influence. Another character with a strong genetic control is forking, which is appreciatively 45% controlled by genotype. Another character, as the total height, had a very weak genetically control, being influenced by the environment in almost 100%, the genotype hardly unparticipating to the phenotypic variation of this character.

CONCLUSIONS

Thus, for the calculation of the heritage coefficients for different characters to establish of the genetically control for each one allowed the calculation of the genetic gain which would be obtained when using these beech origins as reproductive forest materials.

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