

RESEARCH ON THE BEHAVIOUR OF WALNUT BIOTYPES IN DIFFERENT AREAS IN BIHOR COUNTY

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Abstract

The purpose of this work is the study of some walnut biotypes in Bihor county, their knowledge and highlighting the valuable biotypes under the quality aspect, kernel efficiency, fruit size being known that area is particularly favorable to this species.

Therewith, the study aims the discovery and enhancement of biotypes that contribute to the spread of valuable biological material, designed to improve the level of production, which is still at a low level and track down possible biotypes that besides productivity and quality to manifest resistance against the specific diseases.

Key words:walnut, biotypes, the quality aspect, kernel efficiency, fruit size being known, valuable biological material, production, resistance against the specific diseases

INTRODUCTION

Walnut is a traditional fruit growing species for the Romanian people with perspectives to serve, to those who cultivate, to the raise of the standard of living. Often it contributed with its precious fruit to the addend of population income from hills area and even contributed to the improvement of the food ration as fruit or nut oil.

Currently walnut has become a "luxury" fruit tree species, its fruit being requested on the markets of the most advanced countries in very large quantities. The walnut demand is very high and production still deficient worldwide.

For now we can no longer speak about walnut disseminated through other cultures without proper care, with lower productions and poor quality. We must become aware and economically interested on the value of walnut and therefore to achieve a modern crop, highly productive and with valuable fruit, competitive on internal and external markets.

The knowledge gained from Romanian and foreign research, new varieties being available, grafted propagating material and appropriate legislation creates a new availability and interest to those dealing with walnut crop.

Walnut culture is a clear objective for the Romanian society as a whole and for fruit growers in particular. Economic necessity connected to the environmental conditions creates opportunities for a cost effective and future culture.

MATERIAL AND METHOD

The biological material used was represented by multiple biotypes walnut, found in the territory in the years 2013, which have submitted at first sight large or medium-sized fruit, healthy.

These biotypes are presented in Table 1.

From the data of this table follows that the approximate age of the trees was generally less than 50 years, the trees having a height of up to 15 m, and the shape of the crown is free with 5 to 9-sections mounted on a shaft less individualized.

Regarding the production of fruit, this is variable, ranging between 2 to 16 kg / tree depending on the age of the trees.

Working mode consisted in collecting samples of walnuts in an amount of at least 1 kg of each sample, as well as determinations related to the habitus trees. In relation to the age and walnut production, these have been obtained from the sayings of the owners from which were taken samples of nuts, having a guidance value.

Walnut samples have been subjected to determinations by measuring the three dimensions: height (H), large diameter (D) and small diameter (d) using the caliper, then was averaged each biotype.

Thenceforth samples of walnuts were classified by size as: very large, large, medium and small, and by the index form, by the form that each sample presents.

It was then determined the average weight of a fruit and walnut number per kilogram by weighing. Also was set kernel percentage, by the difference between weight of walnuts in shell and kernels resulted after removal of shells.

Table 1

Characteristic elements of trees studied in 2013

Nr crt.	Tree (provenance)	Approximate age	Approximate height	Crown shape	Fruit production kg/tree
1.	Ceica 3	30	12	Leader with 6 framings	12,5
2.	Ceica 5	22	10	Leader with 6 framings	12,0
3.	Gurani 9	30	13	Leader with 8 framings	11,5

4.	Gurani 10	20	10	Leader with 5 framings	11,4
5.	Corbești 14	35	14	Leader with 8 framings	16,0
6.	Cociuba 15	26	12	Leader with 5 framings	10,0
7.	Pietroasa 21	27	12	Leader with 6 framings	11,0
8.	Gurani 25	32	14	Leader with 7 framings	12,0
9.	Cădea 29	25	11	Leader with 6 framings	13,0
10.	Pietroasa 21	30	13	mixed pyramid with 8 framings	14,0
11.	Ceica 35	30	13	Leader with 8 framings	11,5

RESULTS AND DISCUSSION

Table 2 presents the results on the dimensions and fruit size, form, average weight of a fruit, number of fruit per kg and kernel percent. Regarding fruit size, analyzed samples coming from the year 2013 in number of 11 falls within large category, a number of 7 samples, and in the category of medium-sized 4 samples, the fruit mostly shaped oval to ellipsoidal.

The results obtained regarding the average weight of the fruit highlight the fact that biotypes analyzed present an average weight of the fruit between 9.1 and 13.2 g, fruit biotypes with the largest being Ceica 3 and Gurani 25.

Table 2

The main physical property of fruits from some walnut biotypes identified in various localities in Bihor County in 2013

Nr. crt.	Biotype (locality)	Dimensions (mm)			Average	Size	Shape index	Average weight of the fruit (g)	Nr. of fruits/kg	Kernel percent (%)
		H	D	d						
1.	Ceica 3	42	38	3 5	38	Large	Ovoid	13,2	76	46,2
2.	Ceica 5	39	33	3 2	35	Large	Ovoid	11,1	90	47,1

3.	Gurani 9	38	35	$\frac{3}{3}$	35	Large	Ovoid	12,0	83	45,2
4.	Gurani 10	37	34	$\frac{3}{2}$	32	Medium	Ovoid	11,1	90	46,7
5.	Corbești 14	44	35	$\frac{3}{0}$	36	Large	Ellipsoidal	12,4	80	53,0
6.	Cociuba 15	35	30	$\frac{3}{0}$	32	Medium	Ovoid	9,6	104	58,4
7.	Pietroasa 21	40	33	$\frac{3}{3}$	35	Large	Ovoid	10,3	97	53,8
8.	Gurani 25	48	33	$\frac{3}{3}$	35	Large	Ovoid	13,2	76	42,2
9.	Cadea 29	43	29	$\frac{2}{9}$	34	Medium	Ellipsoidal	9,1	109	65,2
10.	Pietroasa 31	44	34	$\frac{3}{4}$	38	Large	Ellipsoidal	12,2	82	48,9
11.	Ceica 35	39	31	$\frac{3}{1}$	34	Medium	Ovoid	11,1	90	46,9

Regarding the number of fruit per 1 kg, this parameter being closely related to the average weight of a fruit, the lowest number of fruit per 1 kg, 76 pieces, is achieved by biotype Ceica 3 and Gurani 25. With larger fruits, worth mentioning, it also presents biotypes Ceica 5, Gurani 9, Corbești 14, Pietroasa 21, Pietroasa 31, at which the number of fruit per 1 kg is of 76 to 97 pieces. At the analyzed samples the percentage of kernel was 42.2% at Gurani35 biotype, biotype Cadea 29 recorded the highest percentage of kernel 65.2%. Fruit size although at first glance seems an important element of productivity if correlates with the percentage of kernel is found that quite often large and very large walnuts have a kernel content expressed as a percentage of fruit weight lower than medium and small walnuts.

CONCLUSIONS

Ecological areal studied in different areas in Bihor County, presents favorable conditions for growth and fructification of walnut, both in terms of climate and regarding soil conditions.

From the total of 11 samples analyzed, 7 samples have very large fruits, with the average of the 3 sizes between 35 and 38 mm, 4 medium, with the average between 32-34 mm.

The fruit shape from walnut biotypes analyzed is generally elongated ovoid with suitable rigid shell and well-welded valves.

Of the total samples are noted 4 biotypes exceeding the kernel percentage of 50%, considered as a criterion for determining the value of a biotype or walnut variety.

Among these biotypes there are two exceptional value respectively Cădea 29 with 65.2 kernel and Cociuba 15 with 58.4% kernel percent.

Also, are of particular interest biotypes Corbești 14 and Pietroasa 21, which have a high content of kernel of over 53%.

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