RESEARCH REGARDING THE FREQUENCY OF APPEARANCE OF CURVATURE AT TURKEY OAK TREES FROM BOBOSTEA FOREST (BIHOR COUNTY)

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Abstract
   The work presents the results of observations performed at the Turkey oak species, in test surfaces placed in Bobostea forest (Bihor county) and not only (Tasnad Forest District and Dumbrava-Beliu Forest District), which allowed certain conclusions related to the frequency of appearance of this defect and of its distribution on the tree quality surfaces.

Key words: wood defectology, curvature, quality areas

INTRODUCTION

The defects of wood have as object the deviations from the regular state regarding the shape of the trunk, structure, integrity of tissues, its chemical composition, but also some structure formations (nodes, heart), deviations which negatively influence the quality and restrain the possibilities of use in certain fields. Also, it answers to the need of profound knowledge of quality, making available descriptions of possible deviations, resulted from a long previous experience (Beldeanu, 1999, 2008).

The curvature is defined as the deviation of the axis of the trunk in a single plan or more different plans (see Figure no. 1); the main causes of the appearance of this defect are: pressure coming from the action of the wind, weight resulted from the load with snow and the accentuated assymetry of the crown (Filipovici, 1964; Ciubotaru, 1998; Beldeanu, 1999).

Fig. 1 Aspect of a simple and multiple curvature at the Turkey oak trees
(87D subcompartment, the VII Bobostea Management Unit)

It is considered a serious defect, limiting a lot the area of use of the wood, the wood pieces obtained from the logs with curvature cannot be used as wood with longitudinal mechanical requirements, because they have diminished resistance. The debiting of wood pieces with this defect is performed with low efficiency, and the wood pieces thus obtained have a deviated fibre and they easily crack through the separation of fibres and drying. This defect may be attenuated through the division of the portion from the trunk affected in two neighbour pieces of wood (Beldeanu, 2008).

MATERIAL AND METHOD

For the purpose to characterize from a qualitative point of view the wood of the Turkey oak trees, within the researched perimeter (Bobostea forest) was placed a number of 14 test surfaces, of variable size (2000-2400 m^2), where measurements and observations were performed at a number of 613 copies of Turkey oak trees. For comparisons, two more test surfaces were placed on Tăşnad Forest District (Satu Mare county), having the size 2000 m^2, where a number of 51 Turkey oak tree exhibits were measured and observed, respectively two test surfaces at Dumbrava-Beliu Forest District (Arad county), with the size 2000 m^2, where, also, a number of 78 Turkey oak tree exhibits were measured and observed. The total number of copies of Turkey oak tree exhibits measured in the 18 test surfaces was of 742 (see table 1).

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Table 1

The Turkey oak tree samples taken from the assessed stand

No.	Forest District/ Management Unit	Subcompartment	Station type	Forrest type	Consistency	Age (years)	Area (m^2)	Assessed standing timber
1	1	3D	6143	7432	0.9	70	2200	30
2	1	5A	6143	7432	0.9	70	2000	47
3	1	6C	6143	7432	0.8	70	2000	45
4	1	8D	6143	7432	0.8	80	2000	43
5	1	34B	6142	7411	0.8	75	2000	46
6	1	55C	6153	7513	0.6	100	2400	30
7	1	69B	6143	7432	0.8	75	2000	50
8	1	77B	6143	7432	0.8	100	2000	46
9	1	83A	6143	7432	0.8	105	2000	58
10	1	87A	6143	7432	0.7	100	2000	46
11	1	87C	6143	7432	0.8	90	2000	44
12	1	87D	6143	7432	0.6	90	2200	30
13	2	124A	8321	7421	0.8	85	2000	51
14	2	128A	8321	7421	0.8	80	2000	47
15	3	9A	6143	7111	0.8	85	2000	40
16	3	16B	6142	7112	0.7	135	2000	38
17	4	62A	6143	7412	0.7	130	2000	30
18	4	72C	6143	7412	0.5	120	2000	21
	Grand total	-					36800	742

Remark for Forest district/Management Unit: 1-Sfănta Maria Forest District/VII Boboştea Management Unit; 2-Oradea Forest District /VIII Mihiş Management Unit; 3-Dumbrava Forest District /I Beliu Management Unit; 4-Tăşnad Forest District/V Supur Management Unit;

The placement of test markets was performed with the help of electronic hypsometer (Vertex IV), in order to determine the inclination and extreme length of the side placed on the largest slope of direction. The test markets have a rectangular shape of 2000-2400 m^2, in relation to the homogeneity in which concerns the station conditions, of coppice and the number of component trees (minimum 30 analyzed trees/test surface), (Dinulică, 2008). The exception is represented by the test surface placed in the 72C subcompartment (Tăşnad Forest District, V Supur Management Unit), in which, due to the forest-technical interventions, the number of remaining trees was smaller (21 exhibits/ test surface).

Starting from the selection system (dimensional and qualitative) of the oak raw wood assortments in compliance to the European norms (Balleux, 2004), we determined three quality areas of the Turkey oak trees on the trunk height: area I of quality contains the first 6 m of the trunk's height, area II goes from the 6th meter until the tree's crown, and area III of quality contains the trees' crown. Also, we defined an intermediate area duet o the incidence of defect son both quality areas I, respectively II.

The office works were represented by the processing and interpretation of data gathered from the field, these were centralized on biological origins

and categories of diameters. The elaboration of charts was performed with the help of Microsoft Excel program.

RESULTS AND DISCUSSIONS

From figure 2 we notice that approximately 60% of the trees analyzed do not present this defect, meanwhile the area I of quality is affected in proportion of 15.4%, area II - 4% and intermediate area-21.2%.
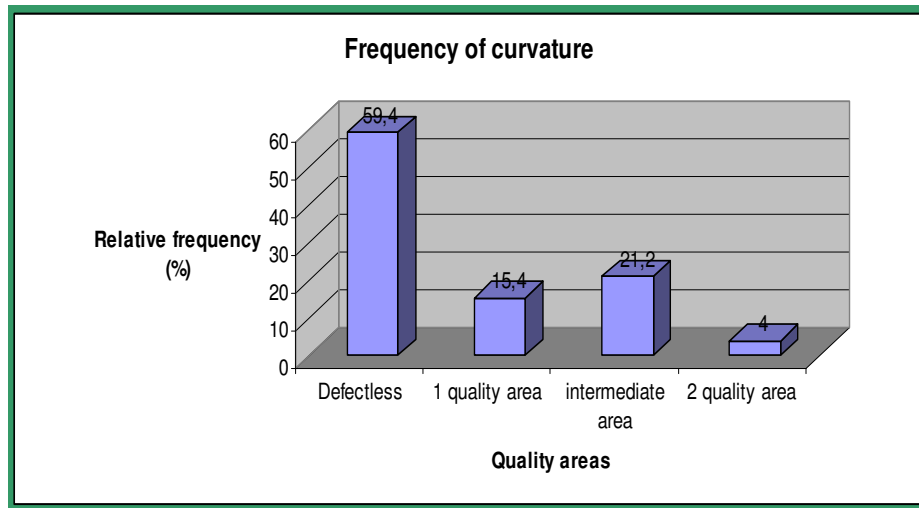

Fig. 2 Frequency of appearance of the curvature on quality areas

As work wood, area I and area II of quality are of special interest, which determines to affirm that this defect does not influence in a significant manner the quality of Turkey oak wood of the area researched.

In general, following the field measurements it was noticed that this defect appears especially where the copies fought for supremacy in which concerns the light, being known that the Turkey aok is a species with accentuated phototrophism.

In which concerns the occurrence of the defect on biological origins, the trees from sprouts are, in general, 4-5% more affected by this defect than the trees coming from seed, the differences being distinctively significant (table 2).

Table 2

The statistical significance of the influence of biological origin of trees
on the presence of curvature

The result of test Kruskal-Wallis: H=8.808627**, N = 742 trees, f = 1 degree of liberty, p=0.30%		
The transgression probabilities matrix on the individual variations caused by the biological origin of the trees		
	Origin of seed	**Origin of sprouts**
Origin of seed		0.008847
Origin of sprouts	0.008847	

CONCLUSIONS

● Following the field analysis, it was noticed that this defect appears especially where the trees fought for supremacy in which concerns the light, the Turkey oak being a species with accentuated phototrophism, approximately 60% of the trees analyzed do not present this defect, meanwhile the rest of the trees affected present the following distribution on qualitative areas: area I of quality is affected in proportion of 15.4%, the intermediate area in a percentage of 21.2%, and the area II of quality-4%.

● In which concerns the appearance of the defect on biological origins, the trees from sprouts are 4-5% more affected by this defect than the trees coming from the seed, and the distribution of types of curvature on biological origins presents as follows: simple curvature (5.67%), double curvature (2.07%), multiple curvature (7.06%) at the exhibits of seed and 9.97%-simple curvature, 2.07%-double curvature, 14.95%-multiple curvature at the copies of sprouts.

REFERENCES

1. Balleux, P., 2004: *Les débouchés du chéne*, Silva Belgica, nr. 6.

2. Beldeanu, E., 2008: *Produse forestiere*, Editura Universităţii Transilvania din Brasov.

3. Beldeanu, E.C., 1999: *Produse forestiere şi studiul lemnului I*. Ed Universităţii Transilvania, Braşov.

4. Ciubotaru, A., 1998: *Exploatarea pădurilor*, Editura Lux Libris, Braşov.

5. Dinulică, F., 2008: *Cercetări privind factorii de influenţă asupra formării lemnului de compresiune la brad*. Teză de doctorat, Universitatea Transilvania Braşov.

6. Filipovici, J., 1964: *Studiul lemnului*, Vol. I, Ed Didactică şi Pedagogică, Bucureşti.

7. ***, 1997: Amenajamentul U.P. VII Boboştea (O.S. Oradea), I.C.A.S. Oradea

8. ***, 1997: Amenajamentul U.P. VIII Mihiş (O.S. Oradea), I.C.A.S. Oradea

9. ***, 2005: Amenajamentul U.B. I Beliu (O.S. Dumbrava-Arad)

10. ***, 2003: Amenajamentul U.P. V Supur (O.S. Tăşnad), I.C.A.S Oradea