

RESEARCH REGARDING THE EXTERIOR WOOD ROT FREQUENCY ON TURKEY OAK TREES (*QUERCUS CERRIS*, L.), FROM BOBOSTEA FOREST (BIHOR COUNTY)

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Abstract: *The work presents the results of the examinations effectuated on Turkey Oak trees in the measurement point from Boboştea forest (Bihor County), which offered some conclusions regarding the presence and localization of the exterior wood rot.*

Key words: *wood defect, exterior wood rot, turkey oak.*

1. Introduction

The wood defect concerns the wood deviation from the normal state regarding the trunk shape, structure, tissues integrity and chemical composition, as well as some structural builds (the knots, the heart), deviations which negatively influence the quality and limit the utilization possibilities in certain domains.

It also answers to the need of deep quality knowledge, offering descriptions of the possible deviations, resulted from a long previous experience [1].

The shape of the tree trunk in transversal section is approximately circular, sometimes drawing near to an eclipse shape, and being controlled by genetic factors, as well as by external factors (the crown asymmetry, unilateral light, the space of

development available unidirectional; the wind blowing from a certain direction, exposition and the land shape etc.), measurable in longitudinal section, the shape of the trunks varies according to the age of the tree, to the stand consistence and to the permanent site.

There are some shape defects [2], of the trunk: the sweep, the comicalness; the root-swelling, the ovality, certain wound defects such as cancer, defect caused by different fungi i.e., rot and the source of some wood defects, which can generate important wood quality depreciation, such as epicormic branches.

The rot is the advanced phase of wood degradation due to the putrefaction process [3] (the action of profound modification of the wood chemical composition followed by the change of color, consistence and its features).

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Complete wood degradation can be produced locally while the trees are alive, making hollow trees, under the xylophages fungi action.

Inonotus obliquus (*Poria obliqua*) or the Turkey oak tree tinder [6], [7] is a dangerous parasite which produces a white wood rot to old Turkey oak trees.

The infection is produced through the surface without cortex of the thick stubs, where it produces first the putrefaction of the stub hardwood, then the stub disappears and there remains an opened wound, not entirely covered by wood.

In early June yellow sclerotium come out at the cortex surface (mid-sized to a fist-sized), with drops of water at the surface (Figure 1), and in time the sclerotium become brown-reddish inside, then it lignifies, getting black and finally their surface cracks irregularly.

The fungus installed in the trunk heartwood produces its rot to the trunk foot rather than upward.



Fig. 1. *The yellow sclerotium presence*

The rot advances quicker upon the early spring wood, the rotted wood presents irregular and alveolar cracks, divided into yellow mycelium tissues.

The rot process extends in the sapwood (alburnum) next to the wound where there is a brown surface (Figure 2), with some centimeters in width between the rot and

the healthy wood. It produces a dry rot that can be easily crushed in the final phase.



Fig. 2. *The rot aspect on a Turkey oak tree (after Pagony H., 1993) Inonotus obliquus, in transversal section*

The rot has an important contribution, the wood declassification depending both on the affected trunk length and how deep it penetrates radially.

In SR 1039 standard, Sessile Oak, Pedunculate Oak, Hungarian Oak and Turkey Oak round wood, bole for industrialization; the defect is calculated differently for hardwood and for sapwood.

Thus, the sapwood rot is not acknowledged for the DV class (round wood for decorative veneer), measurable for the ST class (round wood for saw timber and for other goods obtained through conversion) is admitted.

The hardwood rot is being acknowledged for the DV class (i.e. round wood for decorative veneer) it doesn't outrun a certain level in the diameter of the end where it appears, the same happens for the ST class (i.e. round wood for saw timber and other goods obtained through conversion).

2. Material and Method

The VII Boboștea management unit, where the Boboștea forest is situated, is placed in the great geographic unit of the Carpathians Crișana Hills branch, Beiuș Hills group.

The Turkey oak that stands in this management unit presents good vegetations but the presence of many exterior tree defects can be noticed at a closer look.

The measurement point was placed with the help of the electronic hypsometer (Vertex IV) used for slope determination

and supra length of the part placed on the direction of the steepest slope. The measurement points are 2000-2400 m² rectangular shaped, in relation with the homogeneity under the site features, the stand and number of the trees included (minimum 30 assessed trees/per measurement area).

The Turkey oak trees were divided into 3 quality areas, thus the 1st zoning area is made up of the first 6 m, the 2nd zoning from 6 m to the middle of the crown, the 3rd zoning consist of the crown (see Figure 3).

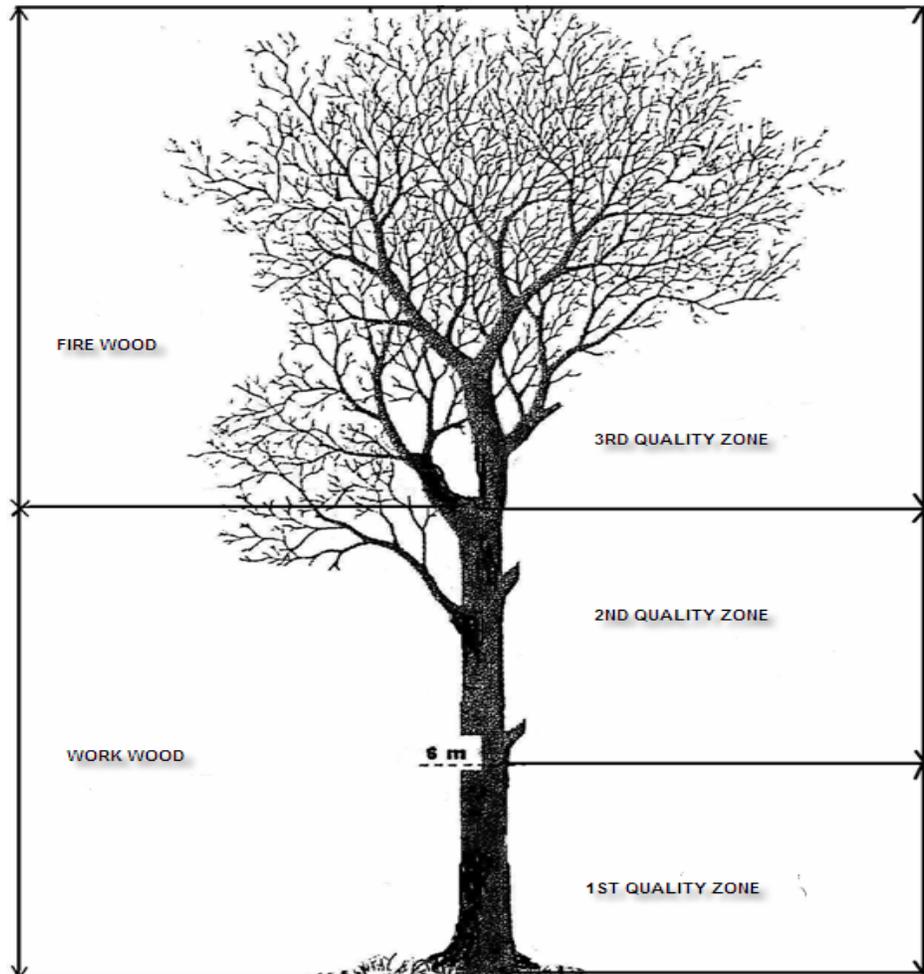


Fig. 3. Turkey oak trees qualitative zoning

There were 743 assessed trees in order to show the exterior rot frequency and localization for the Turkey oak trees in Boboştea forest. The defect distribution was studied on the providence (seed or sprout), age classes (IV, V, VI, VII class) as well as on quality (zoning I, zoning II, zoning III).

The processing and interpretation of data picked up in the field were centralized on providences and diameter categories in the office. The graphics elaboration has been made by using the Microsoft Excel Program.

3. Results and Discussion

The exterior rot appears on average 8% of the analyzed Turkey oak trees (Figure 4) in the 18 analyzed compartments.

A higher frequency of the exterior rot has been noticed at the foot of the Turkey oak trees (the 1st quality zoning, respectively the foot timber part), the exterior rot being the most frequent to the sprouted Turkey oak trees.

A bigger incidence of the exterior rot with the Turkey oak trees can be given by the mother stumps from where they spread to the foot of the growing tree.

The exterior rot frequency at heights (higher than 6 m respectively in the 2nd quality zoning) is of 2%, the average percent per total not exceeding over 1% (Table 1 and Figure 4).

A greater exterior rot frequency in the IV and V age classes has been noticed in the present work (Figure 5).

A greater rot exterior frequency is due to the biological decline of the old trees.

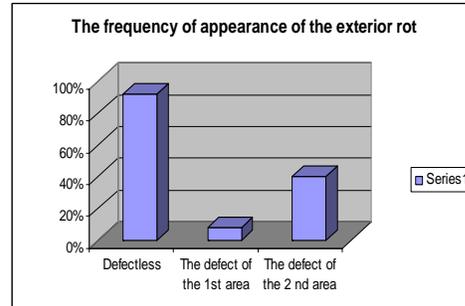


Fig. 4. Frequency of appearance of the exterior rots Turkey oak trees qualitative zonings

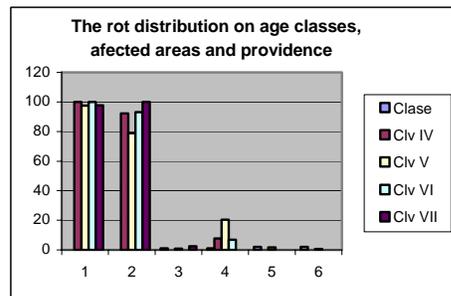


Fig. 5. Exterior rot distribution on age classes, qualitative zonings and providence

Table 1

Exterior rot distribution on age classes, qualitative zonings and providence

Cls.	seed	sprout	seed	sprout	seed	sprout	seed	sprout
	0	0	1	1	2	2	Total	Total
IV	85	206	0	17	0	0	85	223
V	122	128	1	33	2	1	125	162
VI	14	41	0	3	0	0	14	44
VII	83	4	2	0	0	0	85	4
Total	304	379	3	53	2	1	309	433



Fig. 6. Presence of exterior rots on a sprouted Turkey oak tree

4. Conclusions

The wood quality of the trees in our forests is affected by numerous interior and exterior defects, and the causes of their appearance and ways of manifestation may vary.

The wood of the Turkey oak trees reacts differently under the action of certain physical, chemical, and biological factors, which make the defects frequency and development not the same for all the diameter categories.

Many natural factors which have a negative influence upon the trees development can't be avoided (frost, wind, snow action etc.), but can be controlled in a large measure by adequate forestry staff intervention.

The following conclusions can be drawn from the presentation regarding the frequency and localization of the exterior rot on Turkey oak trees:

1. The exterior rot appears on average to 8% of the analyzed Turkey oak trees;
2. A greater frequency of the exterior rot has been noticed at the foot of the Turkey oak trees (the 1st quality zoning respectively the foot timber part), the exterior rot being the most frequent with the sprouted Turkey oak trees (Figure 6).
3. The exterior rot frequency at heights (bigger than 6 m, respectively in the 2nd quality zoning) is of a 2% average in all not exceeding 1%;
4. A greater exterior rot frequency of the IV and V age classes has been noticed.

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