RESEARCHES CONCERNING THE TURKEY OAK FROST-CRACK PRESENCE, IN TURKEY OAK STANDS FROM BOBOSTEA FOREST

Szilard Bartha*

*University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048 Oradea; Romania, e-mail: szilardbartha@yahoo.com

Abstract

This paper presents the results of the observations and measurements on Turkey oak in sample plots placed in Bobostea Forest (Bihor), and conclusions about the localization, frequency and dimension of Turkey oak frost-cracks.

Key words: frost-crack, timber defect, Turkey oak, wood quality

INTRODUCTION

The wood defects are the anomalies from the normal stand, concerning the shape of the stem, the structure, the integrity of the tissues, chemical composition, and a few structural formations (knots, heart of the wood). This anomalies have a bad influence on the quality of the wood and restricts the wood use in different domains.

The study of wood defects answers the need of knowledge of wood quality, describing the possible anomalies, as a result of a long experience. (Beldeanu, E. 2008).

The frost-crack is the radial fissure of the wood, caused by low temperatures (-10…-20 C), which follow after warm periods. The frost-crack generates high tensions in stem, and is a result of the nonuniform contractions in the cross section of the wood. The frost-crack is propagated inside the wood by a radius direction, some times deep inside until the technical hard of the wood. The fissures might be associated with dark liquid leakages. The fissures are closing the same time with entering in vegetation. It is formed a new annual ring which grows abnormally in length and confers the frost-crack margins the shape of the ridge.(Beldeanu, E. 1999)

The frost-crack depreciates the wood quality, especially when the frost callus is not finalized, making the infections propagation possible. The frost-crack is frequently associated with the ring shake and the star shake. The gravity of this wood defect requires a good examination starting with the wood sorting process.

MATERIAL AND METHODS

The management unit VII Bobostea, where Bobostea Forest lies, is located the main geographical unit of the Carpathian domain, The Crisana Hills leader, Beius Hills group.

The Turkey oak forests from this management unit are in good vegetation stand, but looking more closely can be observed many exterior trees defects.

In sample plots localization has been used the electronic hypsometer (Vertex IV), for the determination of the inclination and the over length of the side placed on the highest slope direction.

The sample plots have rectangular shape, 750-2200 m^2 area, depending on environmental conditions, stand and the trees number (30 inventoried trees).

There have been measured 120 Turkey oak trees, following many characters such as presence, dimensions, localization of frost-crack (the frost-crack length was measured with the electronic hypsometer (Vertex IV)

RESULTS AND DISCUSSION

From all Turkey oak wood defects, are significant those which leads on stem penalize, from round wood into firewood. These defects are: wood rot, bifurcation, curvature, frost-crack, knots.To point out the presence, dimensions and localization of the Turkey oak wood defects from Bobostea Forest, were inventoried 120 trees. The distribution of the diameter classes, and the observed defects, are presented in follow:

Table 1

The frequency of visible wood defects on Turkey oak trees

d (cm)	Bifurcation	Curvature	Frost-crack	Wood rot	Knots	Root-swelling	Without defects	Trees Total No
26	-	4	-	-	-	-	-	4
28	-	2	3	-	-	-	2	6
30	-	1	3	2	-	1	3	8
32	1	5	3	-	1	3	1	8
34	-	2	3	4	1	8	3	15
36	1	6	6	4	1	5	-	14
38	-	4	7	3	2	3	3	14
40	-	3	4	1	-	4	4	11
42	1	6	7	1	2	7	1	13
44	-	3	4	1	2	2	-	8
46	-	3	1	-	1	3	1	6
48	-	2	3	1	2	1	-	4
50	-	-	4	1	1	2	-	4
52	-	-	2	-	2	-	-	2
54	1	-	1	-	1	2	-	2
60	-	-	1	-	-	-	-	1
Trees Total No	**4 (3%)**	**41 (34%)**	**52 (43%)**	**18 (15%)**	**16 (13%)**	**41 (34%)**	**18 (15%)**	**120**

It can be observed the high frequency of radial fissures (frost-cracks), the wood shape defects (root-swelling, curvature), comparative with other observed wood defects frequency.

The results from Table 1 are presented in following graphic:

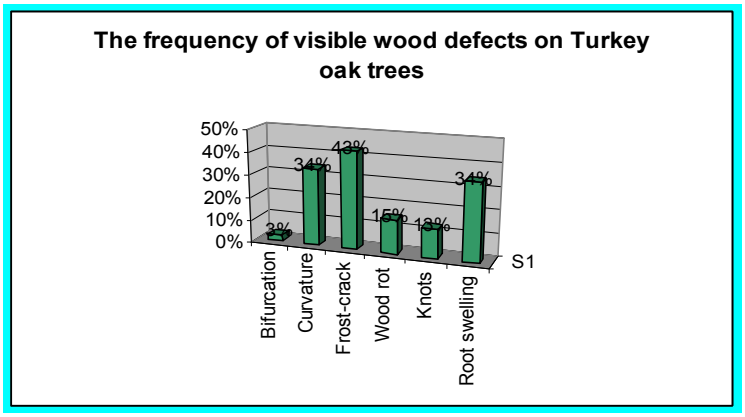

Fig. 1 The frequency of visible wood defects on Turkey oak trees

The frost-crack affects 43% from Turkey oak studied trees (Table 1). It is located on the base of the stem (in the first 3 meters), and is rare presented on longer tree parts.

From the number of studied trees, with frost-crack defect, (52 trees), 22 are from seed (43%) and 30 from shoots (57%).

Almost half from the studied trees (46 trees from seed and 74 from shoots) presents the frost-crack wood defect.

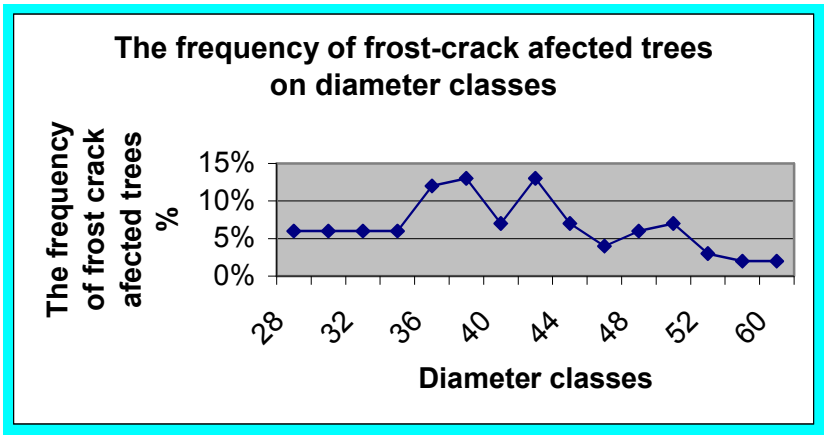

Fig. 2 The frequency of frost-crack affected trees on diameter classes

From the upper graphic can be seen that frost-crack is presented equally at trees from highest diameter classes as well as at the lowest diameter classes.

From the entire number of identified frost-cracks, 79 (100%), 25% were on South side of the trees, 22% on the East side, 12% on West. The situation of the frost-cracks frequency on cardinal points is presented in follow (fig. 3):

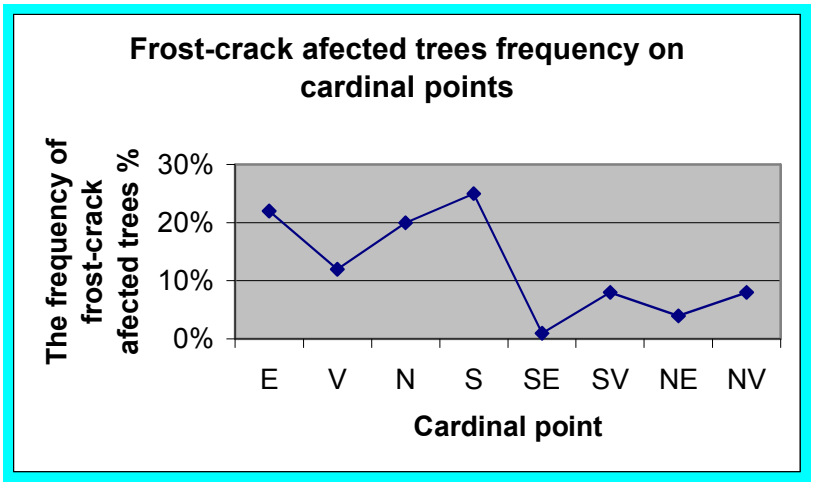

Fig. 3 The frost-cracks frequency on cardinal points

CONCLUSIONS

The wood quality from our forests is affected by many timber defects, inside or outside the wood, and the causes or the manifestation forms are very various

The Turkey oak wood reacts different on the action of divers physical, chemical, biological factors, depending by age. The frequency and the propagation of wood defects are different from one diameter class to another.

Many natural factors have a bad influence on trees growing and can be less avoided (frost, wind, snow), but can be controlled by the professional intervention of silvicultural staff.

The often wood defect on Turkey oak stands from Bobostea Forest is the frost-crack. Studding this aspect we can draw fallowing conclusions:

- it affects 43% from Turkey oak trees;
- it is located on the base of the stem, in the first 3 m;
- affects all diameter classes (low or high);

- the distribution of frost-crack presence on side of the trees by the cardinal points is: 25% on South, 22% on East, 22% on West, 22% on North.

These researches can help avoiding the wood defects and a batter stem quality evaluation of standing timber. The results can improve the capitalization of the wood by a better sorting and can lead to a cutting age revision.

REFERENCES

1. Beldeanu, E., 2008, Produse forestiere, Editura Universității Transilvania din Brasov.
2. Beldeanu, E., 1999, Produse forestiere şi studiul lemnului, Editura Universității Transilvania din Braşov.
3. Beldeanu, E., 1993, Noi elemente de ordin calitativ necesare a fi luate în considerare la sortarea masei lemnoase, In Silviculture and Forest Engineering Transilvania University of Braşov.
4. Beldeanu, E., 2005: Sortarea riguroasă a lemnului arborilor doborâți, premisă a valorificării lui superioare şi complexe, Meridiane forestiere.
5. Câmpu, R., 2007, Cercetări privind frecvența defectelor vizibile în arborete pure de fag din bazinul Târlungului superior, A 8-a Conferință Națională pentru Protecția Mediului prin biotehnologii şi a 5-a Conferință Națională de ecosanogeneză, Braşov.
6. Dinulică F., 2007, Observații asupra gelivurii la brad, în brădeto-făgetele de pe Valea Troainer (Braşov), A 8-a Conferință Națională pentru Protecția Mediului prin biotehnologii şi a 5-a Conferință Națională de ecosanogeneză, Braşov.
7. Leahu I., 2003, Modele şi tehnici statistice-matematice de eşantionaj aplicate în Amenajarea pădurilor, Revista de Silvicultură şi Cinegetică.
8. *** Amenajamentul O.S. Oradea – studiu general
9. *** Amenajamentul U.P. VII Boboştea
10. *** Amenajamentul U.P. VIII Mihiş
11. *** Lemn rotund şi cherestea – Terminologie.