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IMPACT OF SITE QUALITY AND SOME TAXATION ELEMENTS ON BEECH RED HEART FORMATION IN FOREST COMPARTMENTS 107. M.U. „GOSTELJA“ AND 47. M.U. „SREDNJA DRINJAČA“

Utjecaj boniteta staništa i određenih taksacionih elemenata na razvoj neprave srži bukve u šumskim odjeljenjima 107. G.J. „Gostelja“ i 47. G.J. „Srednja Drinjača“

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Abstract

There are many factors that affect appearance and spreading of the red heart in beech stands. Therefore, this research presents an analysis of site quality class and taxation elements (diameter at the breast height, height of the tree and age of the tree) influence on the participation and distribution of the red heart in the forest compartments 107. M.U. „Gostelja” - (II- quality class) and 47. M.U. „Srednja Drinjača” - (III- quality class). The appearance of the red heart on the beech trees considering on the site quality class was researched, as well as the red heart appearance frequency in dependence on the tree diameter at the breast height and age of the tree, size and distribution of the red heart in the longitudinal and transverse direction. The results of research showed that the number of trees with the red heart and the length of the technical roundwood with the red heart increase with increase of diameter at the breast height (age of the tree). As well, it was established that the appearance frequency of the trees with red heart considering the diameter at the breast height (the age of the tree) was larger on the stands belonging low quality site classes. The site quality class affects the distribution of the red heart at the thicker beech trees in the longitudinal direction, while at the thinner and trees of medium diameter, the influence of site quality class on the distribution of the red heart is not expressed in great extent. Larger diameters of the red heart in average have beech trees on the low quality site classes.

***Key words**: red heart, beech, site quality, wood defects, tree, taxation elements.*

INTRODUCTION - *Uvod*

Wood defects are related on the irregularities of the structure, texture, colour and consistency. They reduce technical properties, complicate the woodworking and reduce the degree of usability of the wood. Some wood defects occur during the

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growth and development of the tree, so the term "wood defects" is relative. European beech belongs to one colour wood species at which is optionally created with aging coloured heartwood of irregular shape. Such coloured beech heartwood is called red heart, false heart, copper heart, brown heart or core. Except of the mentioned names, it is also established the name kern (on German Kern). Part with the heartwood of the inner part of the wood has conical shape. Border of the red heart does not match with the boundary of the ring. At the cross section of the borders of the red heart may be: radial, star and of completely irregular shape. The red heart itself can be differently tinted and is not necessarily symmetrical considering the longitudinal axis of the trunk. With drying, the wood does not significantly change the colour. Red heart has a significant impact on the quality of the technical beech wood.

Occurrence and the development of the certain type of red heart is not always conditioned with the impact of one factor, but it is usually the combination of several of them. It is confirmed that there is a connection between the genesis and the degree of development of the red heart and the physiological state in the interior of the tree. As an applicable physiological factor should be considered the vitality of parenchyma cells. The reduction of vitality of the tree is in the close connection with the emergence and the development of the red heart of beech (NECESSANY, 1958, 1969). VASİLJEVİĆ (1974): "Heart wood formation in the region of Zrinjska Gora", came to the following conclusions: the biggest participation of the heartwood in the tree is at the height between 4 and 8 m and then it falls down towards the stump and crown. Heartwood formation in Beech trees influences: a) age, b) rate (magnitude) of the mean diameter increment, c) flushing time d) crown volume. Heartwood formation at this area starts after the age of 75. HİLLİS (1975) mentions that the heartwood formation is the consequence of the dying of the parenchyma cells. The basic difference between the sapwood and heartwood is in the fact that heartwood does not contain life cells of parenchyma. Besides, the heartwood is different form the sapwood because it contains: at parenchyma reduced nucleus, increased content of extract and reduced moisture. In the last twenty years, present knowledge in great extent has added with his research (TORELLİ, 1984, 1994). According to him beech heartwood is caused by the influence of the environment and all the factors that cause the reduction of the content of the water in the central part of the trunk are responsible for its occurrence. Previous researches have shown that the age of stand, diameter of the trunk and stand form (MAHLER AND HÖWECKE, 1991) have significant impact on the size and occurring frequency of the red heart. Lately, a great number of authors research the influence of the rearing methods (care and renewals of the stands) on the quality of the wood assortments, from the point of view of the appearance of red heart (KNOKE, 2003; KUDRA ET AL. 2003; PRKA, 2003; SCHMİDT ET AL. 2005; KADUNC, 2006). Conductive elements are in the part with red heart clogged with tylose so the impregnating agent with difficulty penetrates into the wood (PRKA, 2003) and the impregnated beech tree with the red heart very quickly subjects to rot. Exactly because of the susceptibility to rot of the beech tree with the red heart, that occurrence in the practice and in the wood trade has great significance (GLAVAŠ, 1999, 2003). Red heart

(copper heart) and disturbances in the growth of the trunk of the beech trees are the main phenomena that significantly influence on the quality of raw wood and thus significantly reduce the financial value of the built assortments (BECKER ET AL. 2005). Beech red heart as an occurrence is of great importance for the quality of the technical tree, it induces the expert and scientific interest more than 100 years (KRPAN ET AL. 2006). Numerous theories of interpretations and emergence of red heart are hypothetical even today. In the age from 80 to 90 years of life of the beech trees (what depends on the conditions of growth) comes to the certain disruption of the physiological balance (PRKA ET AL. 2009). Physiologically speaking, the process of dehydration of the central part of the trunk is similar to the genetically conditional red heart formation. For the beech red heart formation are crucial the size of the crown and the diameter of the tree, that is, the fast growth of the tree and the intensity of the reduction of the crown (PRKA, 2010). RAČKO ET AL. (2011) in his paper has researched "The impact of the silvicultural operations on the structure and forming of red heart in beech stands" and has come to the conclusion: that single tree selection and long term cultivation of the beech with the crown bigger then the half of height of the tree in the upper floor creates the preconditions for achievement of the wanted breast diameter from 45 to 50 cm (age 100 to 110 years) with the very small appearance of the red heart.

Presence and the share of red heart at beech trees are unknown until the moment of felling of trees and the making of technical round wood.

MATERIAL AND METHODS OF RESEARCH – *Materijal i metode istraživanja*

The aim of research was to establish if the site quality and taxation elements (diameter at the breast height, tree height and age of the tree) influence on the participation and distribution of the beech red heart. We would come to the knowledge that will contribute to the improvement of management of our most significant and most representative broadleaf tree species, specially in the segment of planning of incomes, that is, the assessment of the assortment structure.

In order to reach this knowledge, the individual or partial research assignments are needed in the function of achievement of the common aim.

Accordingly,research assignments are:

- ✓ field recording and measurement,
- ✓ to establish if the site quality impacts on the emergence and the beech red heart formation,
- ✓ to establish the frequency of appearing of the red heart,
- ✓ to establish if there is the dependence between the processes of beech red heart formation and the age of the trees,
- ✓ to establish the size and the distribution of the red heart in the longitudinal and transverse direction of the trunk and
- ✓ to establish if there is the dependence between the processes of beech red

heart formation and the tree diameter at the breast height, respectively the tree height.

Methods applied in the research may be divided on: a) preparatory (office) works, b) field collecting of data, c) office input of data into the base, data processing, analyses and interpretation of the obtained results.

Within the preparatory works, it was performed the selection of localities by the following criteria:

Two compartments of the different site qualities were selected, department 107. M.U. "Gostelja" (Figure 4) and department 47. M.U. "Srednja Drinjača" (Figure 3) which are located on FMA "Konjuh" at the area of Kladanj; - departments meet with the size of the sample (60 trees) and the mixture ratio with the share of the beech over 50% - cut to lenght method of tree felling and processing was applied on both research localities. The use of this method implies processing of technical roundwood, pulpwood and fuelwood at the stump.

Marking of the trees for cutting was performed within the normal production process, independently on these researches.

After the positioning of the sample plots and the selection of the model trees the following measurements were performed: in every tree from the sample (60 trees by the compartment) two cross diameters at the breast height, height of the tree and the length of the trunk were measured.

In the second phase, after the felling of the trees, the processing of the technical roundwood was performed with the aim of the largest possible qualitative exploitation using the standards for the products of forest utilization (Figure 1).

After the technical roundwood processing, if the red heart occurred, the diameters of the timber and the red heart on the thinner and the thicker end (front) of the log are measured, in the few diameters and the arithmetic mean was taken (Figure 2). In the addition to, in the framework of the broader and long-term research of the assortment structure, are measured all other necessary sizes (diameter at the middle of the log, length of the log) on each exemplary tree.

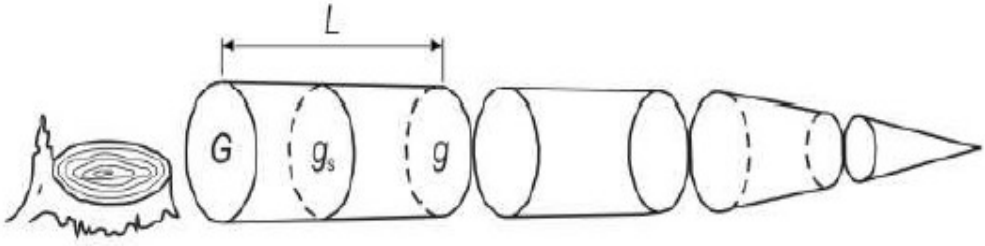


Figure 1. Processing of technical roundwood (Source: Vusić, 2012);
Slika 1. Krojenje tehničke oblovine (Izvor: Vusić, 2012)

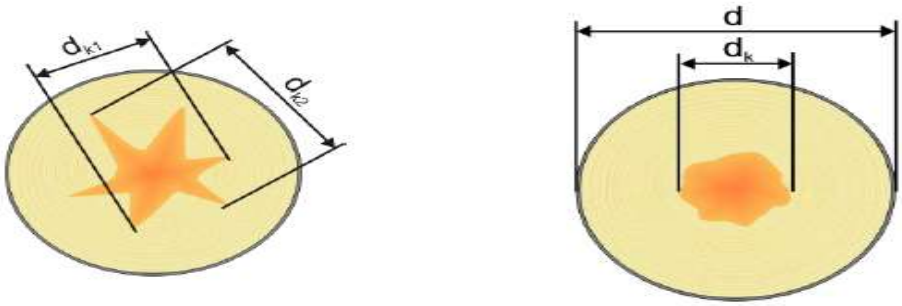


Figure 2. Methodology for a red heart measuring (Source: Vusić, 2012);
Slika 2. Metod mjerenja lažne srži (Izvor: Vusić, 2012)

The volume of the each piece of the technical roundwood was calculated after deduction of the double tree bark using the Huber's formula, while for the volume calculation of the red heart Smalian's formula was used. Smalian's formula is known as the formula of the two end sections, and with it can be exactly establish the volume of the truncated paraboloid (PRANJIĆ AND LUKIĆ 1997). After that, percentage share of the volume of the red heart in the volume of each timber and in the volume of the technical roundwood of each exemplary tree was determined.

It is visible that the determination of the red heart wood is made with the certain simplifications which are conditioned by the proceeding of cutting and processing of the technical round wood. For a more precise determination of the volume of red heart, in each piece of the technical round wood, it would be necessary more cuts or longitudinal slitting of each log, which we could not do from the understandable reasons. We are aware that the most unknowns, on the real volume of the red heart within the pieces of technical round wood remained unsolved at the logs in which the red heart appeared at only one cut (front).

Considering, that the similar manner of grading of red heart is applied during the sorting of the wood assortment into the quality categories and in the trade of wood assortments, we consider this assessment of the red heart wood accurate. At the stump, the rings are counted in order to establish the age of the trees.

Taxation elements of the trees, age and share of the red heart are recorded in the manual, which is specially prepared for this research.

Collected data are grouped in the tables, processed in the software MS Office Excel 2007, while in drawing of plots was used Win GIS 2003.

RESEARCH AREA - *Područje istraživanja*

For the creation of this paper, the field researchs were performed at the area of Kladanj FMA "Konjuh" in the forest compartments: 107.M.U. "Gostelja" and 47M.U. "Srednja Drinjača", on the different classes in the middle-aged stands of beech, during the performing of the regular cutting.

Field works are divided into two phases. In the first phase, before the cutting, the sample was selected from the marked trees at one part of the surface of stand in order to simplify the research paper during the cutting and shortened its duration. In the selection, the diameter distribution of the marked trees was respected. Exemplary trees are selected from the marked trees by placing of most frequently two mutually vertical lines by the azimuth, on each side by 20 m (Figure 3 and 4). All trees of the sample are marked on the field by numbers, in order to enable their monitoring during the whole research.

Compartment 107.M.U. "Gostelja", by the forest management basis belongs to the 1150. management class that include: secondary high beech forests (pure or with other broad-leafs) on the deep acid-brown and/or ilimerized soil on silicate and/or silicate carbonate substrate. The average site quality class of the beech is II-(the second).

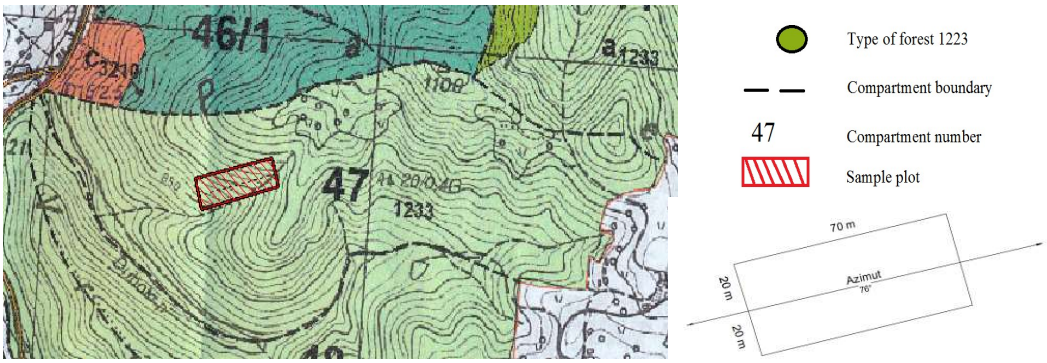


Figure 3.Map of the compartment 47 M.U. „Srednja Drinjača" with the sample plot, R: 1: 10 000

Slika 3. Karta odjeljenja 47 G.J. „Srednja Drinjača" sa postavljenom plohom, R: 1: 10 000

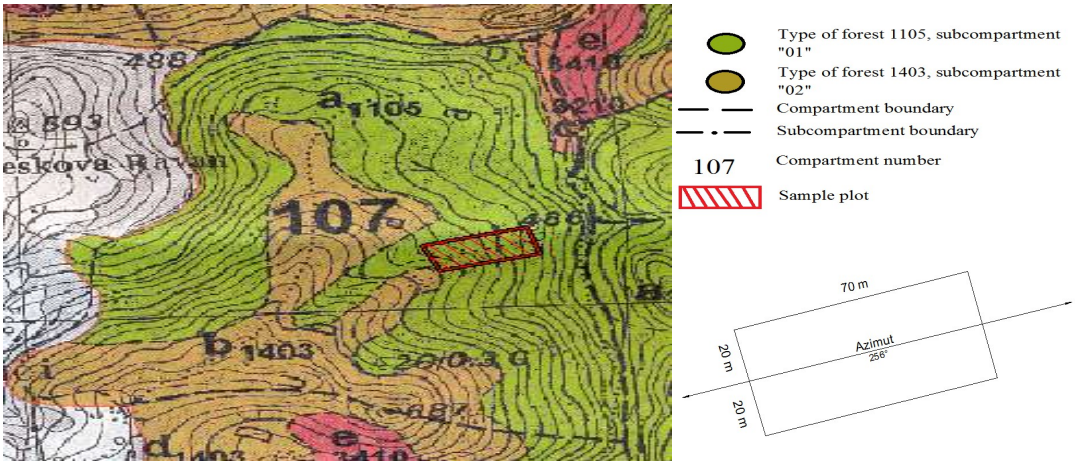


Figure 4. Map of the compartment 107 M.U. „Gostelja" with the sample plot , R: 1: 10 000

Slika 4. Karta odjeljenja 107 G.J. „Gostelja" sa postavljenom plohom, R: 1: 10 000

The compartment 47. M.U. „Srednja Drinjača” by FMB was categorized in 1233. management class, consisted of beech, fir with spruce on the deep soils with the basic eruptives and different derivatives of these forests. The average quality of the beech is III- (third).

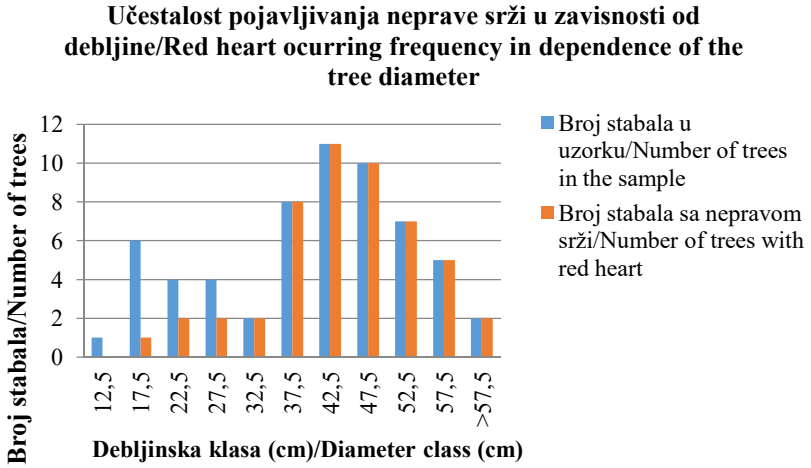
RESULTS AND DISCUSSION - *Rezultati i diskusija*

Due to better visibility of the results of the research, the same are presented separately by the compartments: research with the discussion in the compartment 107. M.U.„Gostelja” and then in the compartment of 47. M.U. „Srednja Drinjača”, and the basic differences that occur between these two compartments are presented separately. Field research and measurements in the compartments are performed by the end of March and at the beginning of April 2013. The data are collected by measurement at the plots in two compartments.

Trees which were taken during the research are from the regular marking of trees for cutting. As it is known, the selection and marking of trees or areas for cutting are performed in accordance with the technical aim of management, prescribed for the concrete management class forestry management class od Forest Management Basis and the concrete stand occurrences. Due to being compelled to take these trees from the understandable reasons, the results which are obtained must be taken with certain reserve.

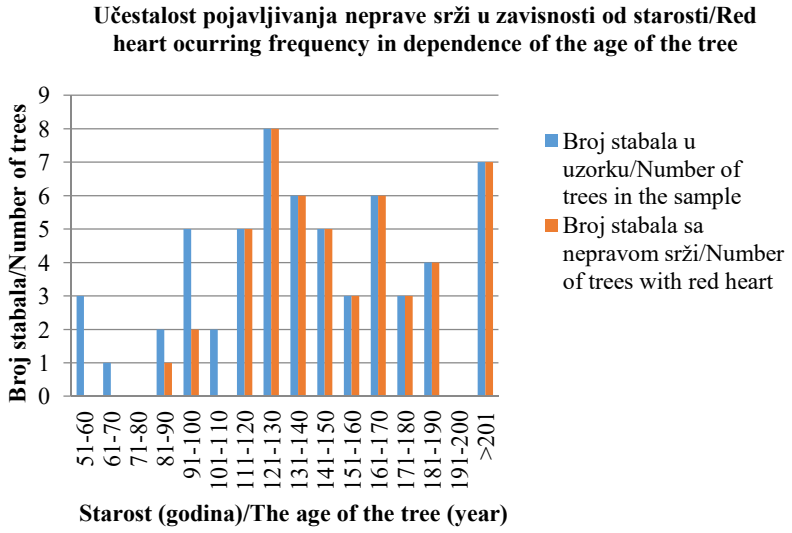
Research results in the compartment 107. M.U. „Gostelja”

On graphic 1. is shown the review of occurring frequencies of red heart beech trees in dependence of the tree diameter.



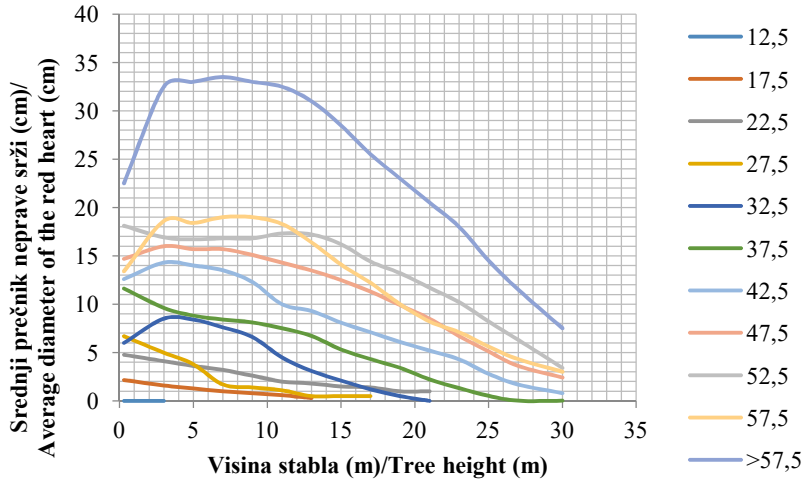
Graphic 1. Occurring frequency of red heart trees
Grafikon 1. Učestalost pojavljivanja stabala sa nepravom srži

Analyzed trees in the compartment (60 trees) are categorized on the degrees of age and it is established the occurring frequency of the red heart by the age degrees (graphic 2).



Graphic 2. Occurring frequency of red heart trees in dependence of the age of the tree
Grafikon 2. Učestalost pojavljivanja stabala sa nepravom srži u zavisnosti od starosti

On graphic 3 is presented the participation and distribution of red heart in the longitudinal and transverse direction by the diameter and height degrees.



Graphic 3. Size and distribution of the red heart in longitudinal and transverse direction
Grafikon 3. Veličina i raspored neprave srži u longitudinalnom i poprečnom smjeru

We will present the tree with the average diameter in the compartment 107. M.U. „Gostelja” as an example of the distribution of the red heart in the longitudinal and transverse direction. By the analysis of the breast diameters in the sample is obtained the average diameter of 43 cm and due to the accuracy during the graphic presentation of the tree with the average diameter are taken all trees from the diameter degrees 42.5 cm and from them are taken the average sizes of the diameter, height, length of the assortments, the size of the red heart in the transverse direction and they are presented at the Graphic 4 and in the Table 1.

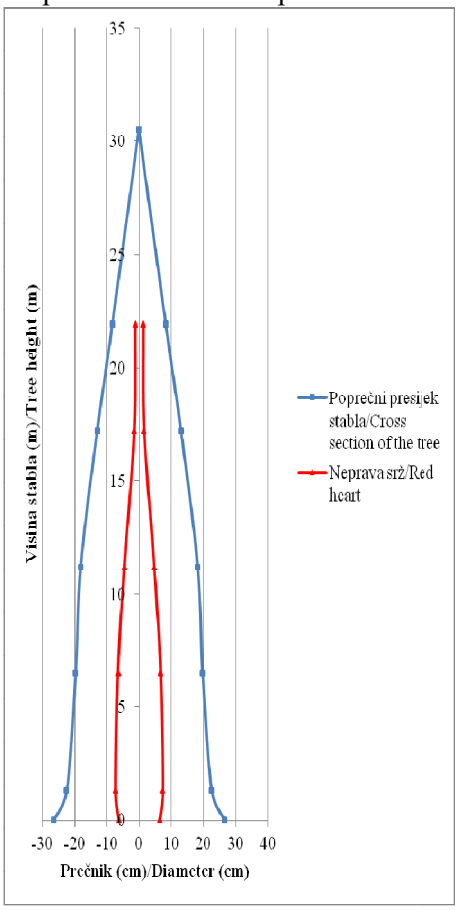


Table 1. Size and distribution of the red heart in longitudinal and transverse direction of the tree with average diameter

Tabela 1. Veličina i raspored neprave srži u longitudinalnom i poprečnom smjeru stabla sa srednjim prečnikom

Stem	d1/3	h	hd	Age of tree	Red heart	
	45 cm	30,5 m	13,2 m	-		
Ass.	L (m)	d1 (cm)	d1/2 (cm)	d2 (cm)	d1 (cm)	d2 (cm)
Ass.1	6,5	53,0	41,6	39,4	12,6	13,2
Ass.2	4,7	39,4	37,3	36,3	13,2	9,2
Ass.3	6,0	36,3	31,8	27,2	9,2	6,8
Ass.4	4,7	18,0	17,8	16,6	3,0	2,4

*Assortment (Ass.)

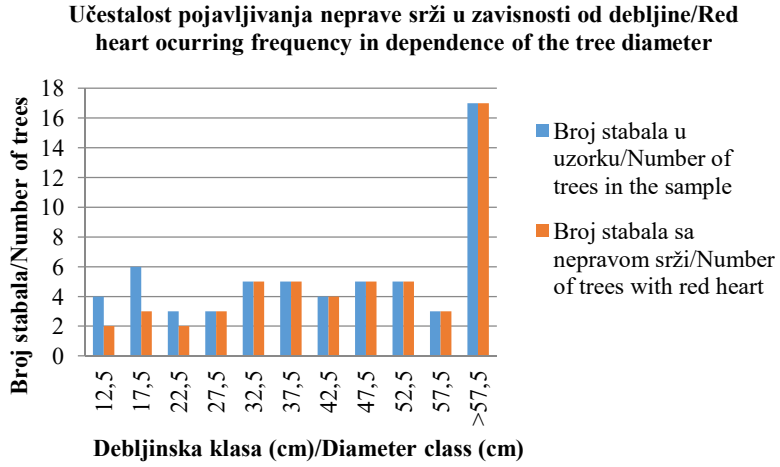
Graphic 4. Size and distribution of the red heart in longitudinal and transverse direction of the tree with average diameter

Grafikon 4. Veličina i raspored neprave srži u longitudinalnom i porečnom smjeru, stabla s srednjim prečnikom

From the graphic 4 it can be seen that the red heart is increased up to 7 m of height and amounts 13.2 cm in the transverse direction after which it culminates and starts to drop towards the top of the tree and on 21 m of height amounts to 2.4 cm.

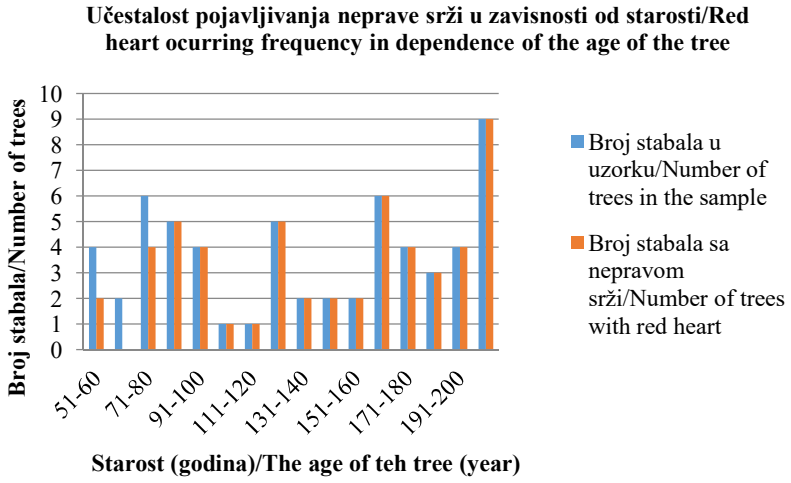
Research results in the compartment 47. M.U. "Srednja Drinjača"

On the graphic 5 is shown the review of occurring frequencies of red heart beech trees in dependence of the tree diameter.



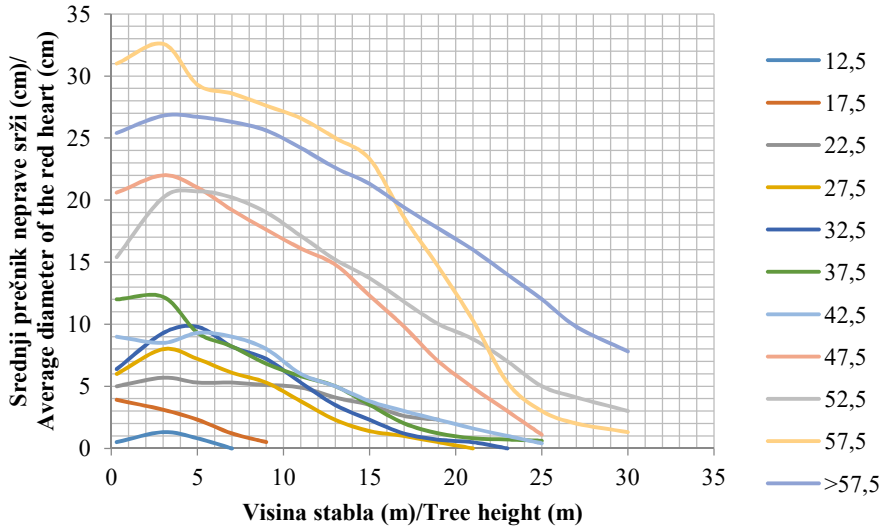
Graphic 5. Occurring frequencies of red heart trees in dependence of the tree diameter
Grafikon 5. Učestalosti pojavljivanja stabala sa nepravom srži u zavisnosti od debljine

On graphic 6 is shown the review of the occurring frequencies of red heart beech trees in dependence of the diameter.



Graphic 6. Occurring frequencies of red heart trees in dependence of the age of the tree
Grafikon 6. Učestalost pojavljivanja stabala sa nepravom srži u zavisnosti od starosti

Size and the distribution of the red heart in the longitudinal direction by comparison with the height of the section (part), as well as the size and distribution of the red heart in the transverse direction in comparison with the height of the section are shown on graphic 7.



Graphic 7. Size and distribution of the red heart in longitudinal and transverse direction
Grafikon 7. Veličina i raspored neprave srži u longitudinalnom i poprečnom smjeru

We will present the tree with an average diameter in the compartment 47. M.U. “Srednja Drinjača”as an example of the distribution of red heart in the longitudinal and transverse direction. By the analysis of the breast diameters in the sample is obtained the average diameter of 43 cm and due to the accuracy during the graphic presentation of the tree with the average diameter are taken all trees from the diameter degrees 42.5 cm and from them are taken the average sizes of the diameter, height, length of the assortments, the size of the red heart in the transverse direction and they are presented at the Graphic 8 and in the Table 2.

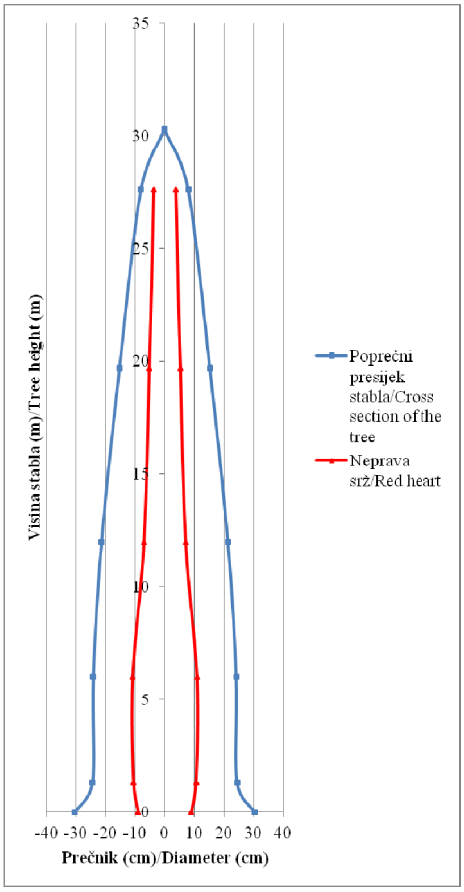


Table 2. Size and distribution of the red heart in longitudinal and transverse direction of the tree with average diameter

Tabela 2. Veličina i raspored neprave srži u longitudinalnom i poprečnom smjeru stabla sa srednjim prečnikom

Stem	d1/3	h	hd	Age of tree	Red heart	
	45 cm	30,5 m	13,2 m	-		
Ass.	L (m)	d1 (cm)	d1/2 (cm)	d2 (cm)	d1 (cm)	d2 (cm)
Ass.1	6,0	61,0	52,6	48,4	18,0	21,8
Ass.2	6,0	48,4	45,0	42,8	21,8	14,2
Ass.3	7.7	42,8	38,6	30,6	14,2	10,6
Ass.4	7.9	30,6	21,0	16,0	10,6	7,6

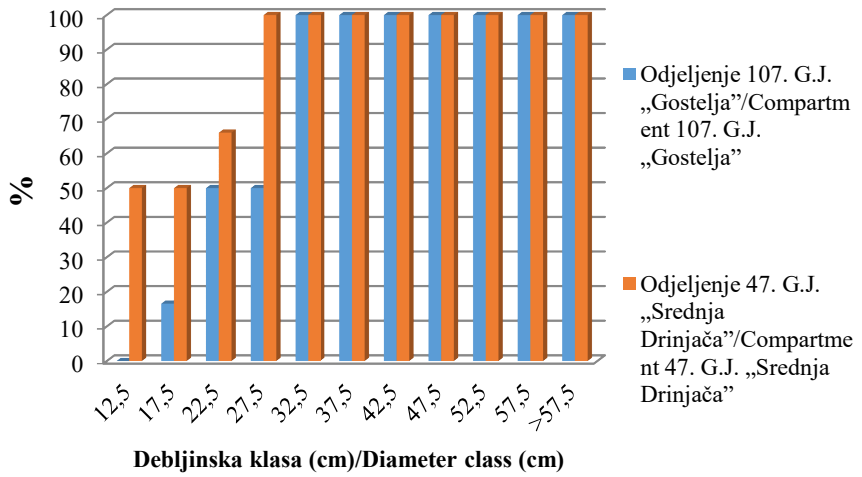
Graphic 8. Size and distribution of the red heart in longitudinal and transverse direction of the tree with average diameter

Grafikon 8. Veličina i raspored neprave srži u longitudinalnom i porečnom smjeru, stabla s srednjim prečnikom

From the graphic 8 it can be seen that the red heart is increased up to 8 m of height and amounts 21.8 cm in the transverse direction after which it culminates and starts to drop towards the top of the tree and on 19 m of height amounts to 7.6 cm, and on 26 m of height red heart amounts to 2 cm in the transverse direction.

In order to achieve the basic aim of research, the participation and the distribution of the beech red heart in dependence of the of the site quality, it is necessary to show the differences obtained in the research in the compartments. Differences in the occurring frequencies of the red heart in dependence from the thickness in the compartments are visible on the graphic 9.

In the diameter degree 12.5 in 107 compartment there are no red heart trees, while in the 47 compartment 50% of the researched trees in the same diameter degree have red heart. In the diameter degree 17.5 cm in 107 compartment 16.6 % of the trees have red heart, while in 47 compartment 50% of the trees from the sample have red heart etc.



Graphic 9. Red heart occurring frequency in dependence of the tree diameter in the compartment 107. M.U. „Gostelja” and compartment 47. G.J. „Srednja Drinjača”
Grafikon 9. Učestalost pojavljivanja neprave srži u zavisnosti od debljine u odjeljenju 107. G.J. „Gostelja” i odjeljenju 47. G.J. „Srednja Drinjača”

In compartment 107. all trees of the diameter degree 32.5 cm have red heart while in compartment 47, the red heart occurs in 100% cases of the diameter degree 27.5 cm. By analysing the research results of both compartments it is visible that the age of the beech trees influences on the process of red heart formation where it can be concluded that by increasing the age of the beech trees is increased the occurring frequency with the red heart. The basic differences that occurred by the research is the age of the beech trees when it comes to appear red heart. In the 107. compartment M.U. "Gostelja" (II- quality) the red heart occurs after the age of 80 and that in the age degree from 81 to 90in 50% of trees covered in the research, while in the age of 111 years and more, the red heart occurs at all trees. In the compartment 47. M.U. "Srednja Drinjača" (III-quality), the red heart occurs after the 50 years, in the age degree from 51 to 60 years in 50% of the trees covered by the researches. In the age degree from 71 to 80, red heart occurs in 66% of the trees and at all trees older than 80 years the red heart occurs.

VASILJEVIĆ (1974) found that red heart forming starts at trees of age over 75 years on the area of Zrinjska gora.

When we speak about the participation and the distribution of red heart in the longitudinal and transverse direction at the compartments 107. M.U. "Gostelja" (II-quality) and the compartment 47. M.U. "Srednja Drinjača" (III-quantity), on the basis of research are visible the differences in the distribution of the red heart in the vertical

direction, the place of the biggest diameter of the red heart in the transverse direction and the place of culmination of the red heart, expressed by the diameter degrees.

Differences between the compartments are the following: at the compartment 107. M.U. "Gostelja" (II-quality) in the diameter degree 12.5 cm does not appear false heartwood while at the compartment 47. M.U. "Srednja Drinjača" (III-quality) the red heart in this diameter degree appears and on the stump amounts 0.5 cm after which it starts to increases up to 4 m of height and culminates and drops towards the top of the tree. At the 107. compartment in the diameter degree from 17.5 to 27.5 cm, the biggest diameter of red heart is on the stump and drops in the average up to 18 m of height, where it gets lost while at the 47. compartment just at the diameter degree 17.5 cm the biggest diameter of the red heart is on the stump, after which it drops to 12 m, where it losses itself.

At 107. compartment in the diameter degree from 32.5 to 47.5 cm the biggest diameter of the red heart is between 2 to 4 m of tree height after which it culminates and gradually drops in the average to 28 m of height. At 47. compartment in the diameter degree from 22.5 to 47.5 cm the biggest diameter of red heart in the transverse direction is the same as in the compartment 107. between 2 to 4 m of height after which it culminates and starts to drop in the average to 28 m of height.

At the compartment 107 in the diameter degree of 52.5 cm was observed double culmination of the red heart. On the stump is the biggest diameter of red heart and it amounts 18.1 cm, and then it starts to drop up to 10 m of the tree height, where it amounts 16.8 cm in the transverse direction, after which it increases up to 12 m, where it amounts 18.3 cm and culminates and begins to drop towards the top of the tree. In the diameter degree of 57.5 cm and more the red heart is the biggest between 6 to 8 m of the tree height after which it culminates and starts do drop toward the top of the tree and it goes up above 28 m. At 47 compartment in the diameter degree of 52.5 cm and more the red heart in the longitudinal direction culminates earlier to 6m of height and it starts to drop towards the top of the tree and goes up above 28 m.

VASİLJEVİĆ (1974) studied red heart formation on beech on the area of Zrinjska gora and established that the largest share of the red heart in the tree was on the height between 4 and 8 m, descending to stump and crown.

If we observe the size of the red heart in the transverse direction, in average, the biggest is in all diameter degrees at the trees which are from the compartment 47. M.U. "Srednja Drinjača" (III-quality).

CONCLUSIONS - *Zaključci*

Based on the performed measurements on the size, distribution and the participation of the red heart on the beech trees in the forest compartments 107. M.U. "Gostelja" and 47. M.U. "Srednja Drinjača" it can be concluded the following:

1. The results of research showed that the number of trees with the red heart and the length of the technical roundwood with the red heart increase with increase of diameter at the breast height (age of the tree) in the both compartments.
2. In the compartment 107 of M.U. "Gostelja" (II- site quality class), red heart occurs after 80 years, while in the compartment 47. M.U. "Srednja Drinjača" (III- site quality class) the red heart occurs after 50 years.
3. The influence of site quality class on the appearance and distribution of the red heart in the longitudinal direction considering tree diameter at the breast height is expressed at the thicker beech trees, while at the thinner and trees of medium diameter is not expressed in great extent.
4. On the low quality site classes red heart culminates betwen 4-6 m of tree height, and then decrease to the top of tree over 28 m, while on the better site quality classes culmination performes later, betwen 6-8 m of tree height and then decrease to the top of tree over 28 m.
5. In average, larger diameters of red heart have the beech trees on the low quality site classes.

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SAŽETAK

Neprava srž ima značajan uticaj na kvalitet tehničkog bukovog drveta, ali još uvijek nije u potpunosti istražena. Provodni elementi su u osrženom dijelu začepljeni tilama, pa zbog toga impregnacijsko sredstvo teško prodire u drvo (PRKA, 2003), te impregnirano bukovo drvo s nepravom srži brzo podliježe truleži. Upravo zbog podložnosti truleži bukovog drveta s nepravom srži, ta pojava u praksi i trgovini drvetom ima veliko značenje (GLAVAŠ, 1999, 2003). Neprava srž (crveno srce) i poremećaji u rastu debla bukovih stabala, glavni su fenomeni koji značajno utiču na kvalitet sirovog drveta, a time značajno smanjuju finansijsku vrijednost izrađenih sortimenata (BECKER ET AL. 2005). U posljednje vrijeme veliki broj autora istražuje uticaj uzgajivačkih metoda (njege i obnove sastojina) na kvalitet drvnih sortimenata, s gledišta pojave neprave srži (KNOKE, 2003; KUDRA et al. 2003; PRKA, 2003; SCHMIDT ET AL. 2005; KADUNC, 2006). Ranija istraživanja pokazala su da dob sastojine, prečnik debla i sastojinski oblik (MAHLER I HÖWECKE, 1991) imaju značajan uticaj na veličinu i učestalost pojavljivanja neprave srži.

Postoji mnogo faktora koji utiču na nastanak i dinamiku širenja neprave srži u bukovim sastojinama. Zbog toga, cilj ovoga rada je procijeniti uticaj boniteta staništa i taksacionih faktora na učešće i raspored neprave srži u šumskim odjeljenjima 107. G.J. “Gostelja” - (II- bonitet) i 47. G.J. “Srednja Drinjača “ - (III- bonitet). Istraživana je pojava neprave srži na stablima bukve, s obzirom na: bonitet staništa, učestalost pojavljivanja neprave srži kod bukve u zavisnosti od debljine i starosti stabala, veličinu i raspored neprave srži kod bukve u longitudinalnom i poprečnom smjeru.

Pojava neprave srži kod bukovih stabala fiziološki je proces, koji u prvom redu zavisi o starosti stabla, debljine stabala i ekoloških prilika staništa. Povećanjem prsnog prečnika stabla (starosti) povećava se broj osrženih stabala, dužina osrženog dijela tehničke oblovine. Učestalost pojavljivanja stabala sa nepravom srži u zavisnosti od debljine, (starosti), veća je na staništima koja pripadaju lošijim bonitetnim razredima. Bonitet staništa ima uticaj na raspored nepravog srca kod debljih bukovih stabala u longitudinalnom smjeru, dok kod tanjih i stabala srednje debljine uticaj boniteta na raspored nepravog srca nije u velikoj mjeri izražen. Prosječno veće prečnike nepravog srca, imaju bukova stabla na lošijim bonitetima.

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