SWEET CHESTNUT TREE (*Castanea sativa* Mill), A VALUABLE BLEND SPECIES IN THE STANDS OF THE PRODUCTION UNIT (U.P.) III HONȚIȘOR, FOREST DISTRICT (O.S.) GURAHONȚ, FOREST REGIONAL BOARD (D.S.) ARAD

Damian Vasilica Laura*, Crainic Ghiță Cristian*

*University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048 Oradea, Romania, e-mail: vasilica8630@yahoo.com
*University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048 Oradea, Romania, e-mail: gccrainic@yahoo.com

Abstract

Cultural and economic value of forest stands depends on the potential silvoproductiv of the resort, their composition and not least the mode of administration and management.

In general mixed stands presents a higher stability, estimating the potential silvoproductiv of superior resorts where it vegetates.

In the case of forest stands that identifies the mixed hardwood stands of the hill, their composition is a basic indicator for establishing the functionality, stability and their productivity.

As a result, the main species, namely base and mixing which can be found in the composition of the stand, fact that explain the identification of better represented massifs of some species.

The sweet chestnut species (Castanea sativa) can form pure stands in its installation situation artificially, or you can retrieve in a mixture with cammon beech (Fagus sylvatica), sessile oak (Quercus petraea), European sweet cherry tree (Prunus avium), common hornbeam (Carpinus betulus), Linden (Tilia cordata), ash (Fraxinus excelsior), field maple (Acer campestre), sycamore (Acer pseudoplatanus).

In the sunny land exhibitions the sweet chestnut can be identify in extended, pure biogroup, featuring a natural regeneration of active status vegetation.

Promoting in future the sweet chestnut species in stand where it is vegetating now represents a target for local forestry administration, for the conservation of fauna and floristic biodiversity respectively for optimal use of forest resources.

Key words: sweet chestnut, hill mixed hardwood forest, stand, composition, potential sylvoproductiv, the main species, the main species of mixture, natural regeneration.

INTRODUCTION

The stand is characterised by a number of structural elements, building their structure, functionality, stability and productivity.

It is known that the stand with how it presents a composition and a more complex structure are more stable, using optimal the sylvoproductiv potential offered by the resort where it is vegetating.

In general mixed hardwood stand represents the most complex forest formations in terms of composition, structure and functionality.

As a result, they have a mixed composition, being made up of species with fitocenotice claims and complementary feed, forming the silvosisteme complex, stable, characterised by a balance ecosistemic stable.

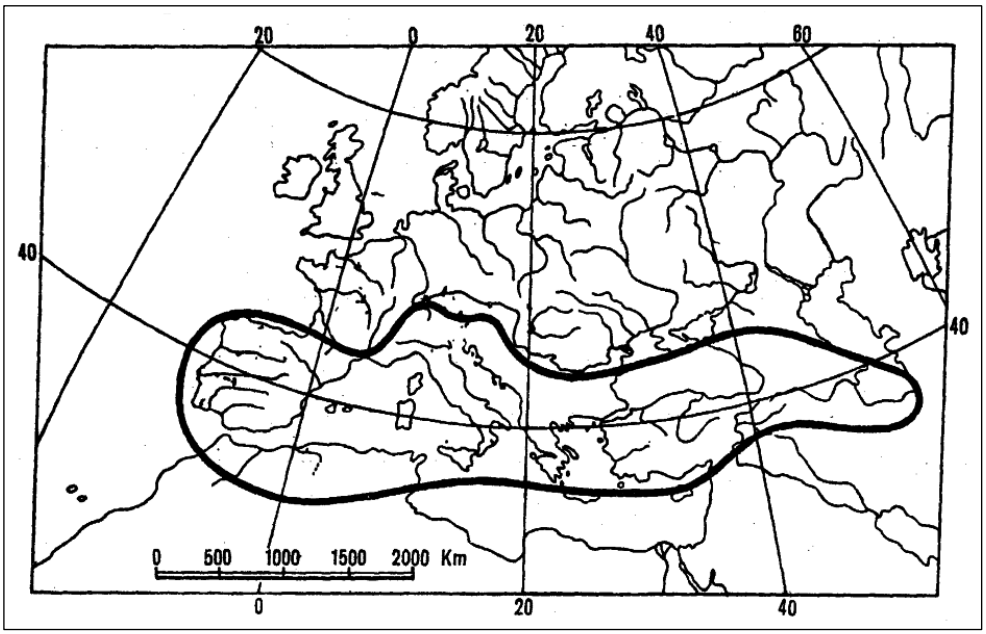


Fig. 1 The european range of species *Castanea sativa* (Stănescu, Şofletea, Popescu, 1997)

Photo. 1 Copies of sweet chestnut (*Castanea sativa*) in the stand of u.a. 36C, U.P. III Honțișor, O.S. Gurahonț, D.S. Arad (original)

The presence of the species *Castanea sativa* in some mixed stands of the U.P. III Honțișor, O.S. Gurahonț, D.S. Arad, identifies the presence of conditions conducive to the environment of this species, and a gentle Mediterranean climate, warm and moist, protected from strong frosts and violent (Stănescu, Şofletea, Popescu, 1997).

Although the conditions for establishment of the production unit III Honțișor not entirely tally with the Mediterranean climate, the species edible chestnut vegetates spontaneously, in appropriate circumstances, a port of the size of the tree and considerable diameters, often exceeding 50 cm to 1.30 m height - photo. 1, adapting to the climatic peculiarities of the resorts where it is found.

At european level (in Spain), known as good can be grown in pure or mixed stands, reclaimed from seed, vegetative and mixed - fig. 2, based on conditions of vegetation and forest management adopted, having multiple uses (Serrada, Montero, Reque, 2008).

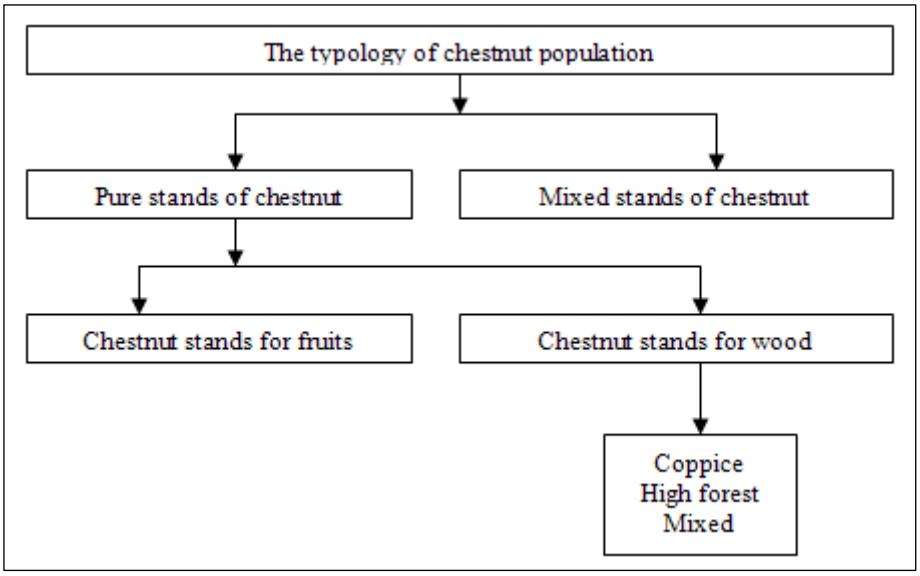


Fig. 2 Typology of forest stands of chestnut (Serrada, Montero, Reque, 2008)

MATERIAL AND METHOD

The case study was done in the U.P. III Honțișor, Forest District Gurahonț, Forest Regional Board Arad in the stand of u.a. 36C.

Observations were made on the itinerary, stationary observations, statistical and mathematical inventory.

For the presentation of the stand space 36C and the simulation of the structure has been used the program PROARB 2.1 (Popa, 1999), size of the

sample plot from which data were collected in accordance with the entry in the program being 25x40 m, i.e. a surface of 1000 m^2.

a) biogroup made up of chestnut and beech b) regeneration of good chestnut

Photo. 2 Aspects analysed in the stand of u.a. 36C, U.P. III Honțișor, O.S. Gurahonț, D.S. Arad (original)

Biogroupe trees of beech and good chestnut were recorded on magnetic media with the help of digital cameras for synthetic analysis - photo. 2a. Also has analyzed the presence seedlings usable in particular the related chestnut species, being recorded on magnetic - photo. 2b.

RESULTS AND DISSCUSIONS

Data recorded in the ground during the implementation of the case study are presented below in tabular form, diagrams and alphanumerical.

For simulating stand structure from u.a. 36C, data recorded on the ground, in the surface of the sample, were imported into the specialized program PROARB 2.1 and processed. As a result I get horizontal profile, vertical profile and the three dimensional profile related to the stand.

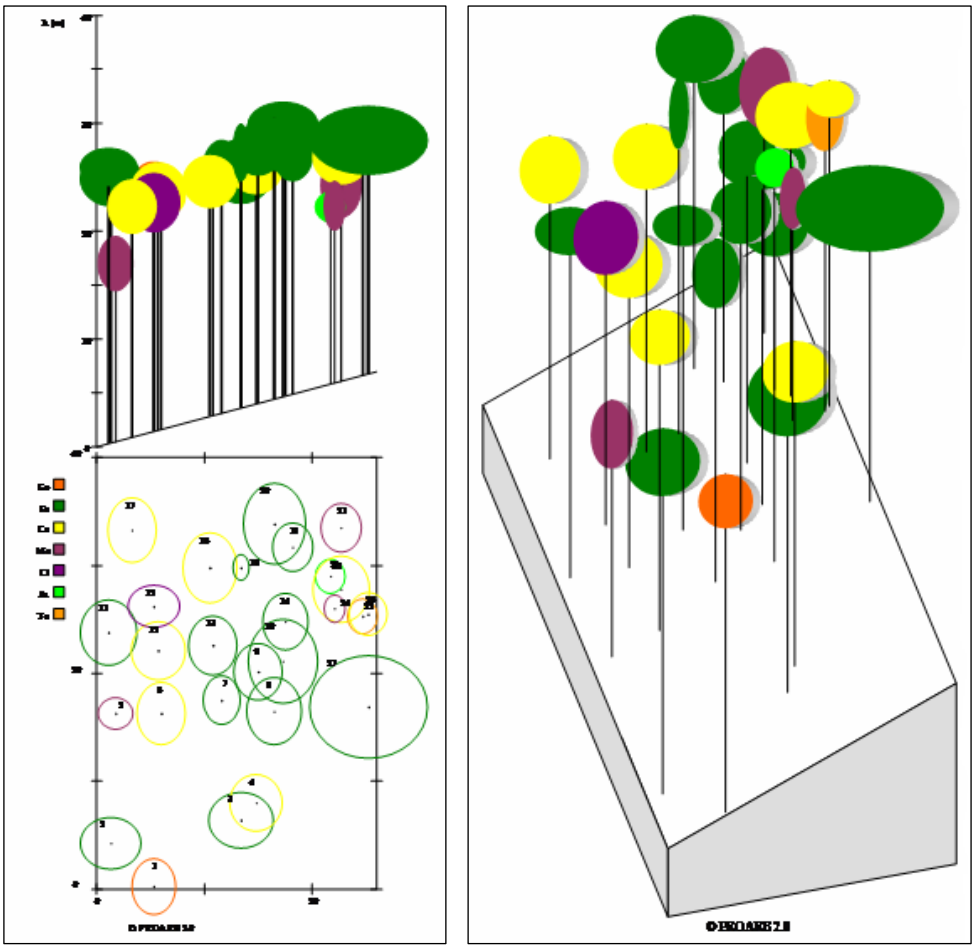
From the analysis of the profiles presented in fig. 3 shows that the stand studied has a composition consisting of several species, namely good chestnut, beech, sessile, cherry, lime, hornbeam, lime, being a genuine us deal with beech.

The free portions of the trees in the ground it was found the presence of a seedling of beech species in more than 60-70% and some biogroupe with seedling chestnut species, usually near the specimens that have enjoyed abundant in the past.

Table 1

Data relating to the spatial structure of the stand from u.a. 36C

No.	X (m)	Y (m)	Dc1 (m)	Dc2 (m)	H (m)	He (m)	Species	Number of tree
1	5.3	0.25	4	5.2	25	21	Go	**27**
2	1.3	4.25	5.6	4.8	27	22	Fa	**Slope**
3	13.4	6.4	6	5.2	24.9	19	Fa	**15**
4	14.8	8	4.9	5.3	24	19.5	Ca	**Profile**
5	1.75	16.3	3.2	2.9	19	14	Me	**length**
6	6	16.3	4.5	5.8	23.7	19.6	Ca	**26 m**
7	11.6	17.5	3.5	4.5	25.3	20.2	Fa	
8	16.45	16.5	5.1	6.2	27.2	22.6	Fa	
9	15	20.15	4.5	5.2	25.8	21.2	Fa	
10	17.3	21.15	6.5	7.8	27.3	23.3	Fa	
11	1.1	23.8	5.2	6.1	27.4	23.9	Fa	
12	5.7	22.1	5	5.4	24.8	20	Ca	
13	10.8	22.6	4.5	5.5	24	21	Fa	
14	17.5	24.8	4.2	5.2	25.3	21.2	Fa	
15	5.3	26.2	4.8	3.9	23.9	18.5	Ci	
16	10.5	29.8	5	6.5	24.2	19.4	Ca	
17	3.25	33.3	4.5	6	23.9	18.9	Ca	**Profile**
18	13.4	29.8	1.5	2.4	26.3	21.1	Fa	**width**
19	18.2	31.7	3.8	4.5	24.8	19.8	Fa	**40 m**
20	16.5	33.85	5.8	7.5	26.1	21.2	Fa	
21	22.7	33.5	3.8	4.5	21.1	15.2	Me	
22	21.7	29	2.8	3.2	17.8	15	Ju	
23	22.7	27.8	5.25	6.2	23.2	18.3	Ca	
24	22.1	26	2	2.5	18.7	14.2	Me	
25	24.7	25.3	2.8	3.2	24.3	19.3	Te	
26	25.2	25.5	3.5	4	24.1	21.4	Ca	
27	25.25	16.9	11	9.5	24.8	18.5	Fa	



a). horizontal and vertical profile b). three-dimensional profile

Fig. 3 The simulation of spatial structure of the stand from u.a. 36C U.P. III Honțişor, O.S. Gurahonț, D.S. Arad

Natural regeneration of the species *Castanea sativa* exhibit a status of active vegetation, having a height of between 15-35 cm in biogroups relatively poorly put into light, and 40-200 cm in the case of where they were made some meshes with the extraction of the products of hygiene and accidental - photo 3.

Because the good chestnuts are sought for both recovery and hunted for food, is explicable on natural regeneration argue that *Castanea sativa* species is present on the lower surface.

a). biogroupe with regeneration under massive

b). eye with regeneration c). biogroupe with regeneration under massive

Photo. 3 Natural regeneration of the species *Castanea sativa* in the stand from u.a 36C, U.P. III Honţişor, O.S. Gurahonţ, D.S. Arad (original)

From data analyzing from tab. 2 and charts in fig. 4 shows that the stand of 36C presents a blend composition, characterized by several elements of the stand.

Table 2

Record trees by diameter and species per hectare in the stand of the u.a. 36C

D(cm)	Species(buc./ha)							Stand (buc./ha)
	Fa	Cas	Ca	Ulm	Ci	Go	Ju	
16	4	0	0	4	0	0	0	**8**
18	8	0	0	0	0	0	0	**8**
20	0	0	8	0	0	0	0	**8**
22	12	0	0	0	0	0	4	**16**
24	4	0	4	0	0	0	0	**8**
26	0	0	0	4	0	0	0	**4**
30	4	0	12	0	4	0	0	**20**
34	4	8	0	0	0	0	0	**12**
36	4	8	0	0	0	0	0	**12**
38	4	12	0	0	4	0	0	**20**
40	4	4	0	0	0	0	0	**8**
42	12	12	0	0	0	0	0	**24**
44	8	4	0	0	0	0	0	**12**
46	4	16	0	0	0	0	0	**20**
48	8	8	0	0	0	0	0	**16**
50	12	0	0	0	0	0	0	**12**
52	8	8	0	0	0	4	0	**20**
54	4	4	0	0	0	0	0	**8**
56	0	4	0	0	0	0	0	**4**
58	16	20	0	0	0	0	0	**36**
60	12	4	0	0	0	0	0	**16**
62	4	4	0	0	0	0	0	**8**
64	8	0	0	0	0	0	0	**8**
66	4	8	0	0	0	0	0	**12**
72	4	0	0	0	0	0	0	**4**
78	0	4	0	0	0	0	0	**4**
Total	**152**	**128**	**24**	**8**	**8**	**4**	**4**	**328**

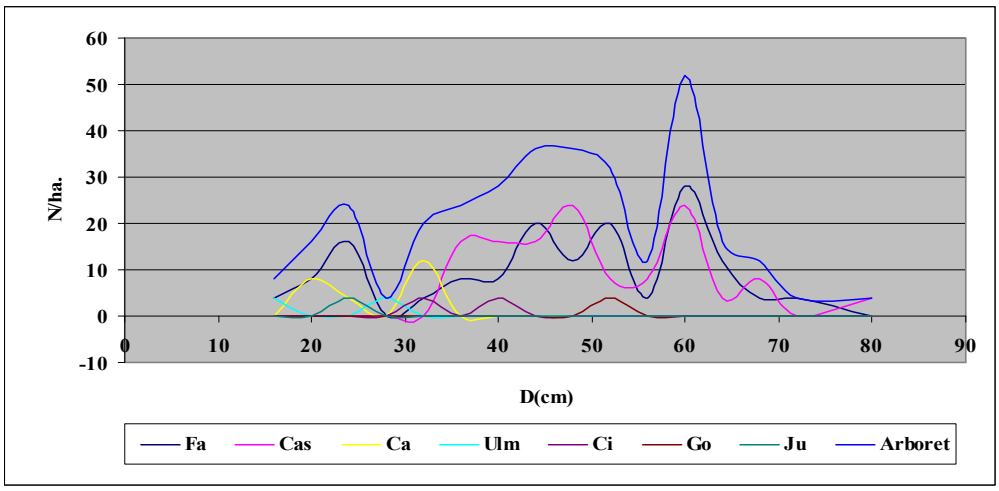


Fig. 4 The distribution of the number of trees by diameter and species in the stand of the u.a. 36C, U.P. III Honţişor, O.S. Gurahonţ, D.S. Arad

It is found that the stand of u.a. 36C has composition number of trees is 5Fa4Cas1Ca, blossoming sweet cherry tree, tall oaks, elm being disseminated and article - fig. 5.

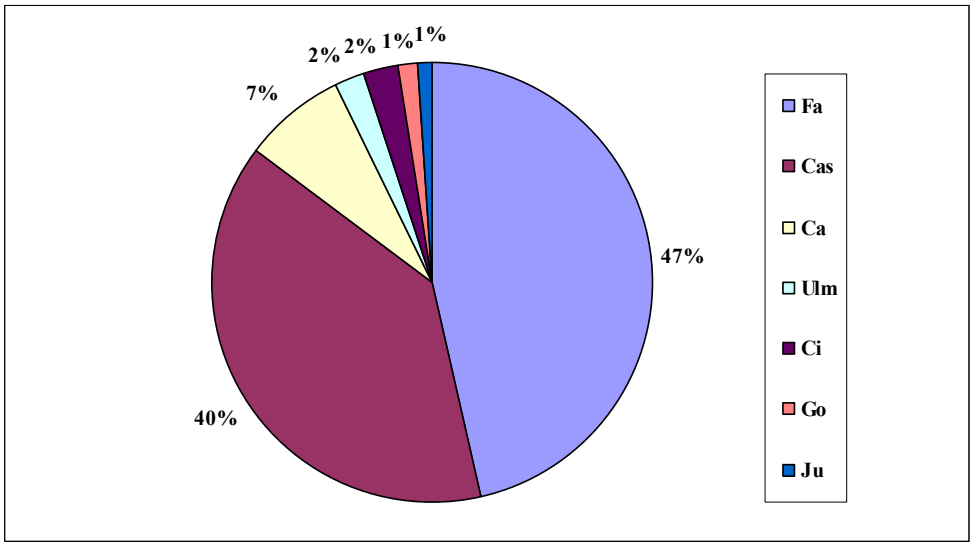


Fig. 5 The composition on the number of trees stand of the u.a. 36C, U.P. III Honțișor, O.S. Gurahonț, D.S. Arad

Composition of stand basal area in u.a. 36C is 5Fa5Cas, and the blossoming sweet cherry tree, hornbeam, common oak, elm and article are disseminated - fig. 6.

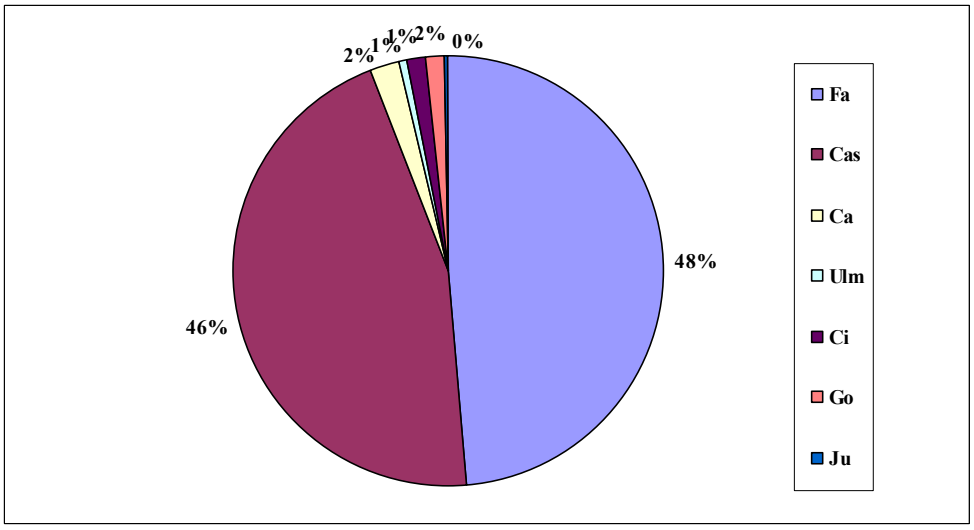


Fig. 6 Composition on the stand basal area of u.a. 36C, U.P. III Honțișor, O.S. Gurahonț, D.S. Arad

Although the chestnut stand of the U.P. III Honţişor were not included in the regions of origin for basic materials from which to obtain forest reproductive materials from Romania (Pârnuţă et. al., 2010), in order to achieve the national Catalog of forest genetic resources (Pârnuţă, 2011), you can identify the populations of this species, with features exceptional forest mensuration, (photo 1, photo 4) for the purposes of the establishment of genuine seeds bases.

Photo. 4 Phenotypically superior trees of the chestnut species in the stand of u.a. 20B, U.P. III Honţişor, O.S. Gurahonţ, D.S. Arad (original)

Photo. 5 Dried chestnut trees of the species in the stand of u.a. 20B, U.P. III Honţişor, O.S. Gurahonţ, D.S. Arad (original)

To support the previous observation which are presented in the photo images. 5 illustrating a number of elements of the stand of the dried chestnut, impressive size and advanced age (about 120-150 years), who crafted the stand in the u.a. 20B.

CONCLUSIONS

The sweet chestnut represents an important species of mixture in stands for hill mixed hardwood forest related with the beech from the U.P. III Honțișor, O.S. Gurahonț, D.S. Arad.

At the stand of edible sweet chestnut 36C presents a percentage of participation in its composition 40-50%.

On relatively sunny exposition of 36C it can identify portions with pure or almost pure massifs of the good chestnut.

A number of copies of the chestnut, with a diameter that exceeds often 60-70 cm at the height of 1.30 m are shot down by wind or snow, or shows some signs of decline physiologically (peak dry and broken, the presence of areas with rot at the base of the trunk, some thicker dry branches, etc.).

This species shows the importance for the particulary valuable wood and respectively for chestnuts, which due to their composition can have various uses in the food industry, pharmaceuticals, etc.

Chestnuts are eaten with great pleasure a couple of hunt species (roe deer, deer, wild boar, etc.), thus contributing to ensuring the continuance of hunting fauna and diversity in these areas.

Thanks to the vegetation conducive conditions species *Castanea sativa*, there is the possibility of specialized crops for edible good chestnuts, both in forestry and outside it.

You can also put the foundations of systems, with the objective of agrosiylvic and culture of edible sweet chestnut from Hayward Forest Gurahonț basin.

For the conservation in situ of local origin can promote sylvester obtained through natural, under massive regenere, using for this purpose the seminologic material for obtaining local forest seedlings in the nurseries managed by fold forest.

Last but not least is the potential offered by beekeeping cultures and the stand of the chestnut.

REFERENCES

1. Crainic G.C., 2007, Îndrumar de lucrări practice, Universitatea din Oradea, Facultatea de Protecția Mediului, Catedra de Silvicultură, pp. 1-100;
2. Negulescu E., V. Stănescu, I. I. Florescu, D. Tîrziu, Silvicultură, 1973, Editura Ceres, Bucureşti, pp. 1-557;
3. Pârnuță G., 2011, Catalogul național al resurselor genetice forestiere, Editura Silvică, Bucureşti, pp. 5-522;
4. Pârnuță G., A. Lorent, M. Tudoroiu, M. Petrila, 2010, Regiunile de proveniență pentru materialele de bază din care se obțin materialele forestiere de reproducere din România, Editura Silvică, Bucureşti, pp. 5-122;
5. Popa I., 1999, Aplicații informatice utile în cercetarea silvică. Programul CAROTA şi programul PROARB, Revista pădurilor, nr. 2/1999, Bucureşti, pp. 41-42;
6. Serrada R., G. Montero, J. A. Reque, 2008, Compendio de Selvicultura Aplicada en Espania, Efca S.A.-Pol. Ind. - Las. Monjas. - Torejon de Ardoz, Madrid, pp. 5-1178;
7. Stănescu V., N. Şofletea, O. Popescu, 1997, Flora forestieră lemnoasă a României, Editura Ceres, Bucureşti, pp. 172-174;
8. **Amenajamentul U.P. III Honţişor, Ocolului Silvic Gurahonț, Direcția Silvică Arad, Studiul General;
9. **Atlas forestal de Castilla y Leon, 2007, Tomo I, Edilesa Leon, pp. 13-386.