

TYPES OF TREE STANDS HARVESTED IN THE DANUBE FLOOD PLAIN, BRĂILA COUNTY

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Abstract: *The types of tree stands exploited in the Danube flood plain in recent years provides important details about the ability of existent species to reach the necessary sizes for the shaping of the qualitative assortment which can make the exploitation activity become profitable or, at best, generate a minimal profit. This analysis can also be the starting point in planning the operation, in analyzing its economic performance setting a goal and objectives to be achieved in order to obtain an economic return.*

Key words: *types of wood, Danube flood plain, willow, hybrid black poplar, native poplars.*

1. Introduction

The forests of the Danube flood plain have been little studied in recent years due to their reduced contribution to the national forestry fund (2% of the surface) as well as to their modest economic importance. The most representative area where these stands vegetate is in the Danube floodplain, between Harsova and Galati, where the river forms its “ponds”. The stands located in this area vegetate in isles and islets with a free regime of flooding and in the dam-shore areas, between dikes and the minor riverbed of the Danube. The assessment and collection of wood in this area is particularly important for maintaining the protective functions which such trees have towards dikes protecting localities or agricultural lands. Wood exploitation in this area is particularly difficult due to the low price obtained for

this wood and the specific conditions under which this activity takes place. The wood assortment determined by evaluation programmes has as a distinguishing criterion the assortment size. Thus, the types of working wood resulted from an assessment of a tree stand are:

- G1 (thick 1) – working wood with a diameter greater than 40 cm
- G2 (thick 2) - working wood with a diameter between 25-40 cm
- M1 (medium 1) - working wood with a diameter between 21-24 cm
- M2 (medium 2) – working wood with a diameter between 16-20 cm
- M3 (medium 3) – working wood with a diameter between 12-15 cm
- LS (thin wood) – working wood with a diameter less than 12 cm
- Bark - bark related to the working wood volume

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Dimensional assortment is determined by the diameter of the tree inventory and the visually determined grade, as a proportion of the total working wood volume of a tree.

Although the differentiation criterion of sorts determined by computer programmes is the dimensional criterion, their participation proportion in the total tree volume is influenced by the visual and subjective assessment of the person assessing the wooden mass. Such software diminishes the percentage of wood depending on the determined quality class, achieving both a dimensional and a qualitative sorting, although sorts are pure dimensional varieties.

Having the dimensional varieties as a starting point in designing exploitation works, the exploitation activity chisels the grade sorts, required by the economic market. Due to this aspect, we will further present the dimensional and grade sorts of the tree stands exploited in the flood plain of the Danube.

2. Dimensional types of wood resulted in the period of 2004-2011 in the Danube flood plain

Since the species present in the flood plain are different in terms of their size when they reach the exploitable age, the varieties dimensional analysis must be performed on each species.

Because the proportion of secondary and accidental products is very small compared to that of the main products, we will perform the analysis of wooden mass assortments depending on the structure determined by the wooden mass assessment programmes and by the documents highlighting the main products in recent years.

In the case of hybrid black poplars, (fig. 1.) the assortment proportion favours the achievement of a satisfactory economic value. Thick dimensional varieties (G1 and

G2) represent over half of the volume registered in the highlighting documents. Under these conditions, it is possible to have a qualitative sorting of the great-sized wooden material in order to obtain valuable items that help increase their economic productivity.

Medium wood has a rather small ratio (13%) of the amount to be exploited, being most often shaped into stere meters for the cellulose industry or for being sold to the population. It is also to the population where the firewood goes, which has a ratio of 16%.

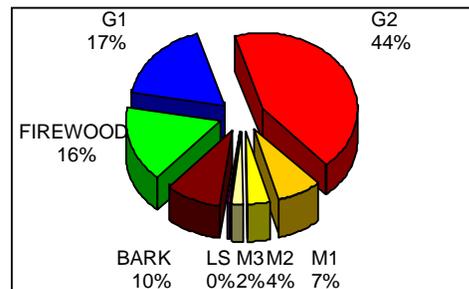


Fig. 1. *Wood assortment exploited in recent years in the Danube flood plain - hybrid black poplar -*

The proportion of varieties determined by wooden mass assessment programmes is met in the forestry practice, there being important the grade sorting of the wooden mass exploited as opposed to the loss of dimensional sorting. This is not surprising given that the quality of wood is the determining factor in its capitalization.

In the case of willow stands, the ratio of dimensional varieties differs greatly (fig. 2.). Due to growing conditions and treatments used (regeneration of willow chairs) thick dimensional varieties are less represented. Thick wood barely exceeds 20% of the wooden mass volume, and the proportion for the medium one is similar. Analyzing the proportion of working wood, we notice that it is somewhere on the half of the

exploited volume. The large presence of firewood is due, as we have said before, to the choice of regeneration treatments and wood structure, which most often vegetates in extreme humidity, this contributing to the modest weight increase and the reduced quality of the wooden mass.

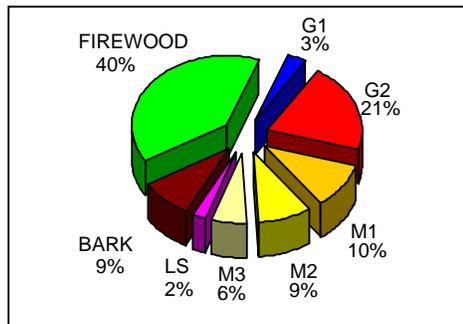


Fig. 2. *Wood assortment exploited in recent years in the Danube flood plain - willow -*

Thick willow varieties, calculated by the wooden mass assessment programmes, also originate in the final cutting where there is registered as dimensional assortment the volume of chairs one or two generations old which, although large in size, fail to be capitalized due to structural defects (rot, hollows, etc).

From the exploitation of wooden mass, performing a qualitative sorting, the ratio of final assortments theoretically established is approximately equal to the real one, except the thick willow wood that is most often shaped into less valuable sorts because of the structural defects.

Native poplar stands, the white and the black poplar, are recorded for exploitability with a dimensional variety similar to that of the willow (fig. 3.) The working wood proportion to the total volume is kept, as well as the distribution of dimensional varieties.

There is a slight increase in the thick wood assortments, native poplars

achieving large exploitability sizes due to the forestry interventions, both on the stand level (thinning), and on the individual level (artificial pruning).

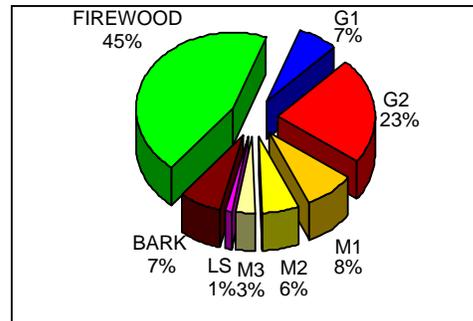


Fig. 3. *Wood assortment exploited in recent years in the Danube flood plain - native poplar -*

Thick wood is present in 30%, the reality of native poplar trees exploitation confirming this. The smaller ratio of wood with a diameter less than 40 cm is due to the visual assessment of the tree grade, due to the uneven conformation of the trunk. Medium wood is found in the theoretically established proportions, perhaps in a slightly larger proportion also due to recording lower grade classes in the process of wooden mass assessment. Due to the specific shape of poplars, the ratio of firewood is about half of the stands.

3. Quality types of wood derived from the exploitation of the stand wooden mass in the Danube flood plain

The qualitative assortment that may result through the exploitation of tree stands in the Danube flood plain consists of: veneer logs, saw logs, other logs, wood pulp, firewood and branches.

The veneer log (fig. 4.) is the best used assortment on the economic market. It derives from the dimensional varieties G1 and G2 of the hybrid black poplar stands.

Among these, the share of this quality sort varies depending on the production class of the stand. Generally, from the stands which are of a superior quality, it is possible to sort 40% of the G1 and G2 assortment volume in veneer logs. Veneer logs generally have a minimum diameter of 24 cm at the thin edge and lengths of over 2,5 m. Quality requirements are related to the diameter and number of knots. Thus the A grade is given by a maximum of 3 knots per piece and maximum one knot over 10 cm, while grade B is given by a maximum of 3 knots over 10 cm and a maximum 8 of knots per piece. Log pieces must be cylindrical, straight, not arrow shaped. The latest quality terms adopted by many beneficiaries in recent years relate to the moisture content of the wood, these asking for a humidity higher than 65%, a characteristic measured with specific equipments.



Fig. 4. *Veneer log resulted from Catargea exploitation 032 (in 2010)*

The timber log (fig. 5.) is the lower range of the veneer log, derivating from the quality sorting of the thick wood that could not be classified as veneer log, to which certain dimensional varieties of medium wood are added. Approximately 50% of the G1 and G2 assortment volume is sorted in the timber log and over 60% of the medium wood, if the beneficiary accepts the diameter terms for the thin end. There

is usually required a minimum diameter of 20 cm at the thin end and lengths of 2,0 m. Quality requirements are imposed by the number of knots and their corresponding diameter, the conditions being much less rigorous, according to case, going up to even 10 knots over 10 cm per piece. Depending on the beneficiary's requirements, it is also possible to sort timber logs with a minimum diameter of 12 cm at the thin edge and lengths of at least 1,5 – 2,0 m. There are no conditions imposed as to the humidity of timber logs. Conditions regarding conical and arrow pieces are less restrictive than for the veneer log. The timber log is shaped from the hybrid black poplar in more than 50% of the exploited volume, but also from the native poplar stands or willow.



Fig. 5. *Saw log resulted from Frecăţei exploitation 307 (in 2007)*

The log for other products is a particular quality assortment, rarely in demand by the economic market and most often for special orders.

The log for tourist amenities (fig. 6.), which must have as large a diameter as possible, most often over 80 cm, with a healthy bone free from rot. It is used for setting up reception spaces and recreational areas, for rustic tables and chairs. The white poplar or willow log is used, knowing that these sorts can grow large diameter varieties.



Fig. 6. *Tourist amenities log resulted from Dobrele exploitation 081 (in 2006)*

The bearing log must be exclusively from willow with a diameter over 1,0 m with a healthy cylindrical bone. It is used for braking devices of large rotors, knowing that willow wood is hygroscopic, a key feature in the operation of these machines.

The rural construction log (fig. 7) is required in areas adjacent to the forestry fund for building houses and household annexes. Hardwood is required for houses, ash tree, and for household annexes the willow or poplar wood is the most sought. The size and diameter of this assortment varies according to population's demand. The sold volume is relatively small, a few cubic meters per year. This also includes the wood used for agricultural equipments and boats.



Fig. 7. *Rural construction log resulted from Basca exploitation 551 (in 2009)*

Cellulose wood (fig. 8) is shaped from the scrap resulted from the log sorting, which meets the length and diameter conditions, and from the thin wood. Cellulose wood must have lengths of 1 meter or 2 meters, depending on the beneficiary's requirements, and a diameter or maximum width of the split billet of 30 cm. The measurement error in the case of cellulose wood is ± 5 cm. There are no conditions to be met regarding the number and size of knots, or regarding the arrow or conical shape of the pieces. For the thick wood of which cellulose wood is shaped it is necessary to perform cracking and splitting operations, so as to meet diameter conditions.



Fig. 8. *Cellulose wood resulted from Rata exploitation 518 (in 2004)*

Cellulose wood is shaped from all species present in the Danube floodplain, the restrictions being imposed by the beneficiary.

Compared to the log, whose capitalization is in cubic meters, cellulose wood is harnessed in stere, for the assortment present in the flood plain the transformation coefficient being equal to 0,68.

Firewood (fig. 9) usually consists of scrap resulting from shaping the other quality types of wooden mass. Firewood is sold to the population for heating houses.



Fig. 9. Home heating wood resulted from *Dobrele* exploitation 220 (in 2011)

4. Conclusions

The dimensional assortment of tree stands in the Danube flood plain reflects their vegetation status and creates the prerequisites for obtaining industrial types demanded by the timber market. The change in proportion for the main types reflects the ability of the natural environment to ensure various conditions for the development of forest vegetation, with the possibility of obtaining valuable varieties that will allow the achievement of a positive economic return. The solution for this is, alongside with veneer and saw log capitalization, finding solutions for the capitalization of the small wood assortment, both for the hybrid black poplar and especially for the willow and native poplars.

The major proportion of small-sized wood within the willow and indigenous poplar stands is due to the extreme conditions in which these types grow, conditions imposed by the particular factors of the geographical environment in

the flood plain area of the Danube. In order to improve the proportion of dimensional types among these sorts, it is necessary to perform maintenance works, both the general ones imposed by forestry management plans and current regulations, and also particular ones that may apply to each individual tree.

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(English version: Gilda Cristina Marinescu)

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