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Elements for the determination best age (age exploitability) which table can be harvest in stands wood household under regular forest treatment

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Abstract Stands at harvest wood from managed forests in the regular regime is very important for quality, quantity and continuity of forest and forest administration to return. Practical help at harvest timber fundamental in defining the structure stands as the aspect ratio but at the same time, it is fundamental to effective forest sector.

Key words

age, exploitability, stand, volume

Exploitable stands are those stands have reached the age exploitability (more optimal harvest age) assigned specific function or whose condition necessitates their early regeneration, established as such by arrangement. Exploitability can be defined as that quality which has a tree or trees to be harvested in relation to socio-economic and environmental objectives pursued. Exploitation the status of a stand is several ways depending on the specific objectives of arrangement and exploitability: absolute protection, regeneration and technical. Corresponding exploitability when the annual average growth of total production is maximum is called absolute exploitability. Good condition when maximizing the effect of the protective environment protection stand called exploitability.

Exploitation determined by biological considerations relating to the ability to regenerate a stand naturally, in the case of forest trees is done regularly in the period in which they can regenerate naturally from seed and coppice stands up to the age at which regeneration of shoots is not satisfactory, exploitability is called regeneration.

Exploitation criteria established by the maximum average growth of total output shaft, calculated in relation to a particular genus or group of types of wood, is called technical exploitability. Age at which a stand is exploitable in relation to assigned multiple functions is called age exploitability and is the main element by establishing production cycle of a forest.

Material and Methods

To analyze and determine the optimal age of harvesting timber stands in the managed forest regime regularly use the following model: We have a management-type subunit-refular forest consists of a number of stands in different productivity. If we denote by v_1, v_2, ... V_n, volume per hectare of these stands in exploitability, and s_1, s_2, ... s_n the areas occupied by stands of productivity class we have the following volumes of material wood (Vi), stands at:$V_1 = v_1 * s_1$, * s_2 $V_2 = v_2$, ... $Vn = v_n * s_n$

total timber volume (Vt), the result of summing all volumes stand at their exploitability age will be:

$Vt = v_1 * s_1 * s_2 + v_2 + ... + V_n * s_n = V_1 + V_2 + ... V_n = \Sigma Vi$,

where i = number of stands (units) that make management division and takes values from 1 to n.

This relationship is valid as long as production conditions do not change, whether annual or periodic operation is, it is a characteristic of each stand.

When ΣVi (Vt) is total output (total volume of wood) stands on the exploitability of surfaces s1, s2, ...ΣIf sn, noting the TE1, TE2, ... Ten ages of stand productivity in exploitability differ, the average annual contribution for each category can be written as:

$Va_1 = Va_1\ V_1/TE_1$, $Va_2 = V_2/TE_2$ ... ... Va_n = Vn / Ten

The annual volume (Va) (annual production) of the entire production fund will be calculated as follows:

$Va = Va_1 + Va_2 + Va_n ... ... = \Sigma Vai / \Sigma TE_i$

where i = number of stands (units) that make management division and takes values from 1 to n

n=number of trees that constitute production fund

Because the same conditions remain unchanged exploitability age that Vt / It will be constant.

If you take into account that v_1, v_2, ... V_n is the volume per hectare in exploitability that:

$v_1/TE_1 = k_1$, $k_2 = v_2/TE_2$; ... ... $v_n / TE_n = k_n$

showing that: $v_1 = TE_1 * k_1$; $v_2 = TE_2 * k_2$; ……………. $v_n = TE_n * k_n$;

where k_1, k_2... k_n is the increase in average production per hectare mainly exploitability.

If you replace these values in relation to the above we have:

$$Vt/Va = \Sigma TE_i * \Sigma k_i * s_i / \Sigma k_i * s_i = \Sigma TE_i$$

Results

Given the above average age of exploitability (TEM) can be calculated as a weighted average age of TE1, TE2, ... TEN in relation to average annual increase in production of surfaces s1, s2, ... sn. TEM can be calculated by volume in which case we deal with TEmv or surface in which case we deal with Tem_s.

$TEmv = V_1 / Vt * TE_1 + V_2 / Vt * TE_2 + V_3 / Vt * TE_3 + ... Vn / Vt * TE_n$ or taking into account only surface:

$Tems = s_1 / St * TE_1 + s_2 / St * TE_2 + s_3 / St * TE_3 + ... sn / St * TEn$

The following table is shown an example of calculation.

Table 1

Determination of average age 10 exploitability stands occupying a total area of 319 ha

No.	s_i	v_i	Vi	s_i /St	V_i/Vt	TE_i	Vai	s_i /St*TE_i	V_i/Vt*TE_i
	ha	mc	mc			ani	mc	ani	ani
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	30	40	1200	0,094	0,0283	90	13	8,46	3
2 A	4	125	500	0,0125	0,0118	100	5	1,25	1
2 B	2	165	330	0,0063	0,0078	100	3	0,63	1
3	39	20	780	0,1223	0,0184	110	7	13,45	2
4	27	100	2700	0,0846	0,0638	110	25	9,31	7
5	45	200	9000	0,1411	0,2126	120	75	16,93	26
6	10	103	1030	0,0313	0,0243	130	8	4,08	3
7	25	100	2500	0,0784	0,059	120	21	9,4	7
8	14	200	2800	0,0439	0,0661	100	28	4,39	7
9 A	32	50	1600	0,1003	0,0378	90	18	9,03	3
9 B	22	125	2750	0,069	0,065	80	34	5,52	5
9 C	40	30	1200	0,1254	0,0283	100	12	12,54	3
10	29	550	15950	0,0909	0,3767	110	145	10	41
Total	St= 319		Vt=42340	1	1	ΣET_t= 1360	Σ Vai =394	-	-
							TEm= 107	TEm_s=105	TEm_v109

Tem in the above table is 105 years and TEm_v = 109 years.

TEm calculated according to average annual production of 107 years Vai is practically the average of the other two.

It can be seen that the difference between TEmv Tem and is only four years that have a variation of only 3.7% which shows that it can be calculated taking into account only the surface volume.

Given the age exploitability determined by species, production class and participation in mixed stands of each species can be: exploitable (EX) when TE-TA < 20, preexploatabile (PREEX) when 40> TE-TA> 20 exploitable (EX) when TE-TA > 40. Where you stand is assigned according to age exploitability of economic and social objectives of protection set, TA is the current age of the stand.

The following table is shown, for example, for four species and various countries employed in a management-type subunit-forest regularly, total area of 471.9 ha, how to calculate the average age by which exploitability be established production cycle.

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Table 2

Calculion the average age by which exploitability be established production cycle

Species	Total forest's area					naturally stand, partly derivatives artificial of upper and middle production 92%				
	Surface		Prod	TE	Cycle	Surface		Produc	TE	Cycle
	HA	%	MED	MED		HA	%	MED	MED	
1	2	3	4	5	6	7	8	9	10	11
1 MO	295,0	63	3,3	99		285,7	66	3,3	99	
2 FA	115,1	24	3,5	104		97,3	22	3,5	105	
3 BR	60,6	13	3,4	95		51,4	12	3,3	95	
4 DT	0,9	-	3,5	99		0,9	-	3,5	99	
5 ME	0,3	-	2,0	100		0,3	-	2,0	100	
TOTAL	471,9	100	3,4	100	100	435,6	100	3,3	100	100

Explanation of table columns content is as follows:

1 - species;

2 - surface species;

Ssp $= \sum_{i=1}^{n} prp_i \times spr_i$ where n-number of current units.; prp - the proportion of current species

3 - percentage of total surface species;

$$P=\left(\frac{S_{sp}}{S_{tot}}\right)\times 100 \ (\%);$$

4 - average production grade of current species;

$$CLP_m=\frac{\sum_{i=1}^{n}\left(\sum_{y=1}^{z} spr_i \times prp_y \times clp_y\right)}{\left(\sum_{y=1}^{z} spr_i \times clp_y\right)},$$

where n - total number of AU sup - surface AU i; prpy - share element y, clpy - production class of the element y, z - number of items in the current species of AU i.

5 - Average age of exploitability;

$$TE_m=\frac{\sum_{i=1}^{n}\left(\sum_{y=1}^{z} spr_i \times prp_y \times te_y\right)}{\left(\sum_{y=1}^{z} spr_i \times te_y\right)},$$ where n - total number of AU sup - surface AU i; prpy - share element y Tey - age exploitability element y, z - number of items in the current species of AU i.

6 - the value of the production cycle;

C = round up to multiple of 5 or 10 years of TEM;

7 - surface species for fundamental natural stands, partly derived and artificial medium and higher productivity;

Ssp =, where n-number of u.a. Current category; sup - surface u.a. current; prpi - the proportion of current species u

8 - percentage of total surface species for fundamental natural stands, partly derived and artificial medium and higher productivity;

$$P=\left(\frac{S_{sp}}{S_{tot}}\right)\times 100 \ (\%);$$

9 - production class average current species stands fundamental natural and artificial partial derivatives middle and higher productivity;;

10 - average age stands exploitability fundamental natural, partly artificial derivatives and middle and higher productivity;

11 - value of the production cycle for the fundamental natural stands, partly derived and artificial medium and higher productivity;

Conclusions

Average age exploitability can be calculated as a weighted average age of trees studied in relation to average annual growth of production, the areas occupied by them. Average age exploitability representing the optimal age of ecological, economic and social, timber harvest, will be calculated as an average age calculated by volume and that the surface is the primary contributing to the establishment production cycle of a forest as it should thus be managed with maximum efficiency in line with sustainable development environment. It can be concluded that although the production cycle is not always identical to the average exploitability age, he established the office and the other elements, it plays most important role.

References

1.Carcea, F., Metodă de amenajare a pădurilor. Editura Agrosilvică, Bucureşt, 1969.
2.Giurgiu, V., Repere ale strategiei dezvoltării durabile a silviculturii. În Silvologie I. Editura Academiei Române, Bucureşti, 1997.
3.Giurgiu, V.; Armăşescu, S.; Decei, I., Biometria arborilor şi arboretelor din România. Editura Ceres, Bucureşti, 1972.
4.Leahu, I., Amenajarea pădurilor. Editura didactică şi Pedagogică RA., Bucureşti, 2001.
5.Leahu, I., Dendrometrie. Editura Didactică şi Pedagogică, Bucureşti. 1994.
6.Banu, C. „Contribuţii privind îmbunătăţirea metodologiei de elaborare a proiectelor de amenajări silvice, în scopul integrării acestora în planul general de dezvoltare rurală durabilă”, Teză de doctorat, 2007.