ISSUES RELATED TO THE ACHEVEMENT OF ARTIFICIAL PRUNING IN THE PRODUCTION UNIT (U.P.) I SÂNIOB, FOREST DISTRICT (O.S.) SĂCUIENI, FOREST REGIONAL BOARD (D.S.) BIHOR

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Abstract

Care works with special character represents a category apart from the sylvotechnics interventions, which aimed to streamline management of the forest stands and to harness the potential of higher silvoproductiv environment. Artificial pruning is a work of care with special character, having a double valence, respectively accessible forest stands and the formation of valuable trunks, cylindrical, without knots, indeed, associated with trees for the future, valued to be led up to the age at which it will capitalize. This work can be done manually or mechanized tiered, depending on structural peculiarities of forest stands that will be achieved. Making artificial pruning manually requires the use of special scissors with force amplifier or some special pruning saws, cutting branches to achieve as smooth, without causing injury to the trunk. To streamline the work of artificial pruning is necessary to establish the trees that will be prune and the height that will prune.

Key words: care works with the special character, artificial pruning, brashing, Sylvester, specialized crops, simulating intervention

INTRODUCTION

The efficiency of management of the forest stands and assume the application work in particular, hygiene, pruning, brashing and maintenance of the massive.

The technology of these special interventions is differentiated according to their specificity.

As a result care works with special character may be carried out manually or in mechanized with the characteristics of forest stands and logistics the existence of logistics base.

Artificial pruning consists in cutting the branches at the base of the Crown, on a certain height, in order to facilitate accessibility in the stands-of pruning or to lead to the formation of valuable trunks-trunks training pruning (Florescu I.I., Nicolescu N.V., 1998).

The brashing targets removing greedy branches on the trees which are exposed to a sudden or strong lighting and were in this situation being affected quality of the trunk (Florescu I.I., Nicolescu N.V., 1998).

Artificial pruning works and brashing can be achieved with mechanics tools named brashes - fig. 1a. With these mechanics tools you

can cut green branches, dried and the guzzlers at different heights, depending on the specifics of the technology and these works.

Also, you can use the various aggregates that lifting at certain heights for manual or mechanized of artificial pruning - fig. 1b.



a) the using of brash b) using aggregates for lifting Fig. 1 Making artificial pruning (**Atlas forestal de Castilla y Leon Tomo II, 2007)

In some situations, when it wants to be accessible of the young stands or initialization of trunks training (Doniță N., Borlea F., Turcu D., 2006), you can manually, using for this scissors for pruning trees, scissors with amplifier, saws of pruning trees, special Pruning Saws-bot by mousing.

The artifical pruning, cutting height is determined according to the structural features of the stand, respectively, species, age, height, diameter of trees and branches that need to be cut (**Norme tehnice 2, 2000).

MATERIAL AND METHOD

The case study was conducted within the production unit (U.P.) I Sîniob, Forest District (O.S.) Săcuieni, Forest Regional Board (D.S.) Bihor in a culture of poplar euramerican (*Populus x canadensis* Moech - Stănecu V., Şofletea N, popescu O., 1997) aged 7 years.

It was covered with artificial pruning and brashing the whole culture, all specimens being pruning on a height of between 2 and 3.5 m. To achieve these cuts care with special character special saws were used, which achieves cutting in both directions. It was recorded during each cutting twigs with timer and their diameters were measured with caliper (Tuduce A., 2012).

They also have achieved horizontal profiles, vertical and threedimensional in Canadian poplar culture before and after interventions, using for this purpose the program PROARB 2.0 (Popa I., 1999), simulates thus the proposed works. As a result they set two sample plot with dimensions of 25 x 20 m (2,500) each, where they collected related data entered in the card program PROARB 2.0.

RESULTS AND DISSCUSIONS

Data recorded in the ground during implementation of the case study are presented below in tabular form. For every tree that was pruned or brashed-the order number, the number of branches and the time of realization of the work (tab. 1, 2).

Table 1

		Data relating to the realization of the prune in the stand of Canadian popiar							
	Tree	Number	Cutting	Tree	Number	Cutting	Tree	Number	Cutting
		of			of	time tree		of	Cutting
	number	branches	time tree	number	branches	time tree	number	branches	time tree
	1	1	1.87	43	2	3.12	85	3	10.79
	2	1	1.9	44	2	3.22	86	3	11.39
	3	1	1.99	45	2	3.11	87	3	10.48
	4	1	1.88	46	2	3.28	88	3	10.75
	5	1	1.87	47	2	2.23	89	3	10.88
	6	1	1.93	48	2	1.98	90	3	10.65
	7	1	2.07	49	2	3.22	91	3	11.33
	8	1	2.08	50	2	3.09	92	3	11.21
	9	1	2.06	51	2	1.99	93	3	11.54
	10	1	2.09	52	2	2.87	94	3	11.11
	11	1	2.1	53	2	2.31	95	3	11.23
	12	1	2.16	54	2	2.09	96	3	11.09
	13	1	2.12	55	2	2.26	97	3	11.44
	14	1	2.03	56	2	3.44	98	3	11.98
	15	1	2.21	57	2	3.55	99	3	10.72
	16	1	2.26	58	2	3.58	100	3	11.22
	17	1	2.31	59	2	3.71	101	3	11.34
	18	1	2.41	60	2	3.87	102	3	11.29
	19	1	2.88	61	2	3.95	103	3	11.72
	20	1	3.33	62	2	4.02	104	3	11.87
	21	1	3.61	63	2	4.11	105	3	11.37
	22	1	3.85	64	2	4.01	106	3	11.87
	23	2	1.77	65	2	4.31	107	3	12.11
	24	2	2.42	66	2	4.3	108	3	13.01
	25	2	2.31	67	2	4.21	109	3	13.03
	26	2	2.22	68	2	3.21	110	3	12.09
	27	2	2.42	69	2	3.2	111	3	12.38
	28	2	2.49	70	2	3.38	112	3	12.39
	29	2	2.48	71	2	3.22	113	3	12.29
	30	2	2.57	72	2	3.62	114	3	12.13
	31	2	2.43	73	2	3.76	115	3	12.72
	32	2	2.39	74	2	3.23	116	3	12.44
	33	2	2.62	75	2	3.41	117	3	12.22
	34	2	2.58	76	2	3.55	118	3	12.32
	35	2	2.72	77	3	9.33	119	3	12.54
	36	2	2.59	78	3	11.14	120	3	13.13
	37	2	3.41	79	3	10.22	121	3	13.03
	38	2	3.22	80	3	11.02	122	3	13.17
	39	2	3.01	81	3	10.23	123	3	13.21
	40	2	3.29	82	3	10.44	124	4	11.33
	41	2	3.11	83	3	10.21	125	4	10.19
	47		377	84	4	1019	126	4	12.87

Data relating to the realization of the prune in the stand of Canadian poplar

Table 2

	Number			Number			Number	/
Tree	Number	Cutting	Tree	Number	Cutting	Tree	Number	Cutting
number	01	time tree	number	01	time tree	number	01	time tree
number	branches		number	branches			branches	
127	4	13.88	182	5	20.32	237	6	31.42
128	4	13.65	183	5	21.03	238	6	31.84
129	4	13.41	184	5	20.88	239	6	31.22
130	4	13.71	185	5	21.68	240	6	31.86
131	4	14.03	186	5	21.75	241	6	31.21
132	4	13.97	187	5	22.08	242	6	31.52
133	4	14.61	188	5	21.87	243	6	29.98
134	4	14.22	189	5	21.09	244	6	33.12
135	4	14.82	190	5	21.03	245	6	31.08
136	4	19.91	191	5	21.25	246	6	32 32
137	4	15.04	192	5	21.90	247	6	32.52
138	4	15.01	193	5	221.91	248	6	32.11
130		15.11	104	-	22.02	210	é é	32.15
139	4	15.75	194	5	22.87	249	6	32.29
140	4	19.51	195	5	22.43	250	6	32.11
141	4	14.87	196	5	21.92	251	6	32.09
142	4	13.55	197	5	21.87	252	6	34.88
143	4	15.11	198	5	22.01	253	6	28.76
144	4	15.65	199	5	22.32	254	6	29.54
145	4	15.31	200	5	22.78	255	7	47.22
146	4	15.71	201	5	22.18	256	7	46.33
147	4	15.55	202	5	22.09	257	7	46.22
148	4	15.09	203	5	23.09	258	7	48.59
149	4	15.19	204	5	22.41	259	7	49.27
150	4	15.41	205	5	22.81	260	7	49.35
151	4	15.9	206	5	22.71	261	7	49.49
152	4	17.21	207	5	22.54	262	7	49.84
153	4	19.09	208	5	23.02	263	7	49.18
154	4	16.17	209	5	23.19	264	7	50.22
155	4	16.01	210	5	23.33	265	7	50.41
156	4	16.22	211	5	23.41	266	7	51.39
157	4	16.09	212	5	26.85	267	7	51.11
158	4	16.65	213	5	27.51	268	7	51.65
159	4	17.98	214	5	28.91	269	7	48.32
160	4	16.39	215	5	30.76	270	7	49.81
161	4	16.19	216	5	30.92	271	7	47.76
162	4	16.22	217	5	34.12	272	8	47.55
163	4	19.87	218	5	36.23	273	8	46.98
164	4	16.43	219	5	35.12	274	8	48.31
165	4	18.91	220	5	26.54	275	8	49.67
166	4	16.87	221	6	28.76	276	8	50.11
167	4	17.32	222	6	29.82	277	8	49.87
168	4	18.43	223	6	30.52	278	8	51.02
169	4	15.65	224	6	30.81	279	8	52.87
170	4	16.02	225	6	31.01	280	8	55.38
171	4	12.76	226	6	30.47	281	8	57.25
172	4	18 21	227	6	30.86	282	8	58 52
173	4	17.88	228	6	30.51	283	8	48 54
174	4	18.44	229	6	30.27	284	8	52.12
175	5	21.65	230	6	30.71	285	9	52.28
176	5	20.08	230	6	31.02	286	9	54 38
177	5	20.00	231	6	31.87	287	9	57.09
178	5	20.40	232	6	31.07	287	9 Q	57.07
179	5	20.12	233	6	31.02	280	9	56.87
190	5	20.11	234	6	31.52	209	9	58.00
100	5	20.01	233	6	31.32	290	10	58.07
202	10	58 20	230	10	50.2	271	10	61 72
292	10	59.42	294	10	50.54	290	10	62.24

Data relating to the realization of the prune in the stand of Canadian poplar (further)

The analysis of the data in tables 1 and 2 are found that have been cut a varied number of branches per copy, from a branch up to 13.

The average time of elagare cutting of T_m branches depending on the diameter of the Insert on the trunk D_i is shown in table 3.

Table 3

Relationship between cutting time and sec	ction for diameter Canadian poplar species
$D_i(cm)$	$T_m(s)$
1	2.3
2	3.1
3	11.6
4	15.8
5	23.6
6	31.2
7	49.2
8	51.4
9	56
10	59.7

The correlation between the average cutting branch (T_m) and their diameter to the Insert on the trunk (D_i) is shown graphically and synthetic in fig. 2.



Fig. 2 Correlation between the average time of cutting branches and section elagate for diameter Canadian poplar species

In the case of artificial pruning in Canadian poplar species shows very strong correlation between the average time of cutting branches (T_m) and their diameter (D_i) .

Simulating the proposed interventions and in the stand of Canadian poplar synthetic is presented with the program PROARB 2.0 (fig. 3, 4, 5, 6), in the two sample areas. You may find that the cut height after applying the intervention will allow easy access to creating premises stand an superior trunk return of specimens of the species cutting from Canadian poplar.



a). Stand before the artificial pruning
b). Stand after the artificial pruning
Fig. 3 Simulation of artificial pruning in the horizontal plane and vertical in Canadian poplar culture (sample plot 1)





a). Stand before the artificial pruning Fig. 4 Artificial pruning simulation in 3D plane in Canadian poplar culture (sample plot 1)



a). stand before the intervention b). stand after the intervention Fig. 5 Simulation of artificial pruning in the horizontal plane and vertical in Canadian poplar culture (sample plot 2)





a). stand before the intervention b). stand after the intervention Fig. 6 Simulation of artificial pruning in 3D space in poplar culture euramerican (sample plot 2)

Results of apprying pruning in Canadian popular culture from Sintob forest range										
-	The location study									
	The sample plot number 2			(11.(1))	The sample plot number 1					
No.	h _{ef} [m]	h _{ei} [m]	$\Delta \mathbf{h}_{e} = \mathbf{h}_{ef}$ - $\mathbf{h}_{ei} [\mathbf{m}]$	$(\Delta h_e/h) x$ 100[%]	No.	h _{ef} [m]	h _{ei} [m]	$\Delta \mathbf{h} = \mathbf{h}_{ef} - \mathbf{h}_{ei} [\mathbf{m}]$	$(\Delta h_e/h)$ x 100 [%]	
1	1.5	1.1	0.4	4.7	1	1.6	1.2	0.4	4.3	
2	1.7	1.2	0.5	6.2	2	1.5	1.1	0.4	4.2	
3	1.7	1.4	0.3	3.6	3	1.7	1.3	0.4	3.7	
4	1.9	1.5	0.4	5.9	4	1.9	1.6	0.3	2.7	
5	1.8	1.2	0.6	11.3	5	1.9	1.8	0.1	0.9	
6	1.5	1.1	0.4	11.1	6	1.8	1.1	0.7	10.4	
7	1.6	1.2	0.4	9.5	7	1.8	1.2	0.6	7.3	
8	1.9	1.5	0.4	6.5	8	1.5	0.6	0.9	7.6	
9	1.8	1.4	0.4	4.8	9	1.6	0.8	0.8	6.6	
10	1.8	1.4	0.4	5.6	10	1.7	1	0.7	8.3	
11	1.8	0.7	1.1	13.1	11	1.5	1.3	0.2	3.2	
12	1.9	1.3	0.6	7.3	12	1.9	1.4	0.5	5.4	
13	1.8	1.2	0.6	7.4	13	1.7	1	0.7	6.7	
14	1.9	1.6	0.3	3.8	14	1.6	1.2	0.4	3.9	
15	1.7	1.3	0.4	5.1	15	1.7	1.3	0.4	3.3	
16	1.9	1.4	0.5	5.3	16	1.9	1.2	0.7	6.4	
17	1.8	1.5	0.3	3.3	17	1.9	1.1	0.8	17.8	
18	1.8	1.3	0.5	5.1	18	1.3	0.7	0.6	5.8	
19	1.7	1.4	0.3	3.2	19	1.6	1.2	0.4	2.8	
20	1.8	1.3	0.5	5.9	20	1.3	0.8	0.5	4.1	
21	1.7	1.1	0.6	8.3	21	1.6	1.3	0.3	3.1	
22	2.3	1.7	0.6	8.2	22	1.9	1.2	0.7	7.1	
23	1.9	0.8	1.1	12.1	23	1.8	1.3	0.5	6.0	
24	2.3	1.5	0.8	9.1	24	1.5	0.8	0.7	11.3	
25	1.9	1.4	0.5	6.0	25	1.7	1.2	0.5	13.9	
26	1.7	1.4	0.3	5.1	26	1.8	1.3	0.5	4.1	
27	2.3	1.8	0.5	5.4	27	1.3	0.9	0.4	7.4	
28	2.1	1.7	0.4	4.7	28	1.8	1.2	0.6	5.0	
29	1.9	1.6	0.3	3.2	29	1.9	1.4	0.5	4.0	
30	2.2	1.6	0.6	8.3	30	1.4	0.9	0.5	3.8	
31	1.7	1.2	0.5	6.2	31	1.9	1.1	0.8	6.2	
32	1.8	1.6	0.2	2.4	32	1.9	1.2	0.7	5.2	
33	1.9	1.4	0.5	7.0	33	2.1	1.7	0.4	2.9	
34	1./	1.3	0.4	5.5	34	2	1.2	0.8	6.1	
35	1.8	1.4	0.4	4.5	35	1.9	1.1	0.8	0.0	
36	1.9	1.2	0.7	10.1	36	1.8	1.3	0.5	3.8	
3/	2.1	1.5	0.6	0.8	3/	1./	1.2	0.5	3.9	
38	1.9	1.0	0.3	3.9	38	1.0	1.5	0.5	2.0	
39	2.2	1.5	0./	1.5	39	1.5	1.2	0.5	4.0	
40	2.3	1.9	0.0	3.9 8 0	40	1.8	1.5	0.5	4.2	
41	2.3	1./	0.0	0.0	-	-	-	-	-	
41	1.9	1.5	0.0	9.2	-	-	-	-	-	
42	2.2	1.5	0.7	7.4	-	-	-	-	-	
43	2.1	1.4	0.7	1.4	-	-	-	-	-	
45	1.2	1.0	0.4	4.0	-	-	-	-	-	
	1.5	1.1	0.7	- ./						

Results of applying pruning in Canadian poplar culture from Sîniob forest range

Table 4

Analyzing data from the sample plot no. 1 (tab. 4) shows that the artificial pruning in Canadian poplar culture from Sîniob forest range was achieved on a stretch of 2,5-17,8% of the total height, one copy was cut on 17,8% of the total height.

From the analysis of data from the sample plot no. 2 (tab. 4) shows that the artificial pruning in Canadian poplar culture from Canton Sîniob forest range was achieved on a stretch of 2,4-13,1% of the total height, without exceeding 13,1% of it.

CONCLUSIONS

Artificial pruning it is an indispensable intervention for young trees which are consist of species that are relatively difficult natural prune, because it allows proper accessible and leads to the formation of trunk wood quality.

Through the implementation of mechanized artificial pruning and the brashing, these works can be qualitatively and economically efficient.

Although artificial pruning and the brashing can be mechanized in some situations-if the young forest stands-mechanization is not justified, under the expenditure report and technical efficiency respectively.

For young trees are recommending the use of tools and simple devices, saws, scissors, scissors for horticultural use with amplifier, because the diameter of branches that will be cut is relatively low.

The first pruning does not reduce the depth of the crown more than 1/3 of the height.

It is recommended that preservative sections cut using special substances to preservative and to heal up relatively quickly produced wounds.

It is preferable carrying out artificial pruning in the off-season of vegetation, with the concomitant cutting in dry with the green.

Although in specialized crops for the production of wood with various uses-Canadian poplar crops, will achieve a first pruning at all specimens, the following interventions are recommended cutting with predilection to phenotypically superior trees, which I assume will reach the age of exploit.

Trees that are proposed to be cut artifical will materialize through doughnut with paint (to layer) or with colored tapes adhesive (to hammer), to be more easily identified.

The material resulting from browsing with artificial pruning of the various stands or specialized crops can be used for making wattle-work, fascine, antierosion fence etc.

REFERENCES

- Doniță N., F. Borlea, D. Turcu, 2006, Cultura pădurilor (Silvicultură în sens restrâns) - Note de curs, Editura EUROBIT, Timișoara, pp.1-367;
- Florescu I.I., N. V. Nicolescu, 1998, Silvicultură vol. II Silvotehnică, Editura Universității Transilvania din Braşov, pp. 58-64;

- 3. Popa I., 1999, Aplicații informatice utile în cercetarea silvică. Programul CAROTA și programul PROARB, Revista pădurilor, nr. 2/1999, București;
- 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;
- 5. Stănescu V., N. Şofletea, Oana Popescu, 1997, Flora forestieră lemnoasă a româniei, Editura CERES, București, pp. 3-451;
- Tuduce A., 2012, Proiectul tehnico-economic de aplicare a elagajului artificial în arboretele din cadrul U.P. I Sîniob, Ocolul silvic Săcuieni, Direcția silvică Bihor, pe perioada 2011- 2012, Proiect de diplomă, Universitatea din Oradea, Facultatea de Protecția Mediului, Departamantul de Silvicultură și Inginerie foreastieră;
- 7. **Amenajamentul unității de producție I Sîniob, Ocolul Silvic Săcuieni, Direcția Silvică Bihor-Studiu general;
- 8. **Atlas forestal de Castilla y Leon, 2007, Tomo I, Edilesa Leon, pp. 13-386;
- 9. **Atlas forestal de Castilla y Leon, 2007, Tomo II, Edilesa Leon, 393-887;
- 10. **Norme tehnice 2, 2000, Ministerul Apelor, Pădurilor și Protecției Mediului, Tipărit la S.C. INTER-PRINT S.R.L. Bacău, pp.7-142.