

## INFLUENCE OF THE VOLUME TO BE EXTRACTED UPON THE TENDING COSTS (CLEANINGS) IN THE DECIDUOUS FORESTS IN THE PLAIN AND HILLY AREA

Timofte Adrian Ioan\*, Seghedin Georgeta Silvia\*\*

\* University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048, Oradea, Romania, e-mail: [adi\\_timofte@yahoo.com](mailto:adi_timofte@yahoo.com)

\*\* National Forest Administration Romsilva, Bd. Magheru 31, sectorul 1 Bucuresti, Romania, Doctoral student of "Stefan cel Mare" University Suceava, e-mail: [georgetaseghedin@gmail.com](mailto:georgetaseghedin@gmail.com)

### Abstract

*In this paper some aspects regarding the reduction of costs for cleanings in the plain and hilly area and the main factors that interfere with the value of the labour necessary for the execution of this works according to the volume to be extracted, slope are presented. The calculi have been done according to the unified labor standards in the forest works, respectively to the time rules.*

**Key words:** cleanings, strips, intensity of tending cuttings, minimum expenditure.

### INTRODUCTION

More broadly, tending and forest management refers to the system of silvotechnical works and interventions regarding the growth and development management of the forest from its establishment until its exploitability term, to meet the settled objectives (Florescu, Nicolescu 1998).

In the Romanian silvotechnical-related literature and practice, this intervention system was called stand tending works or cultural operations, the last term being also in the accordance with the content of these silvotechnical measures (\*\*\*, 2000; Horodnic, 2003; Milescu, 2006).

#### **The main factors influencing the cleaning costs are:**

- work intensity, volume to be extracted;
- group of species;
- working mode (on all surface or in strips of 4-6 m width);

Means: tools and mechanisms (where appropriate and depending on equipment) axes, scissors with power amplifier (for section cutting diameters up to 40-50 mm), hand saws, portable motor-aggregates equipped with knife-disc, etc. For wood harvest, some appropriate means with animal-drawn and mechanical means can be used depending on the equipment (Oprea, Sbera, 2000);

- periodicity of cleanings, their number;
- usage of some experienced workers.

**Material resources** (tools and work equipment) must be as efficient and productive, with low fuel consumption.

**Profitability** is the favorable result (in financial terms) of an economic activity, resulting in increased revenue to expenditure and creating an excess that could provide value called profit.

Unfortunately, the economic operators are only interested in the immediate profit they can get.

It is necessary to pursue both **immediate economic efficiency** of each executed work, and the **overall profitability** achieved through the whole series of works through which the forest is managed till the due date of exploitation.

In terms of **immediate economic efficiency**, the application of forest tending and management works is required from itself, since through these interventions a considerable amount of wood is introduced into use. Without the intervention of the works mentioned above, the respective amount of wood, which can represent up to 50% of the harvested wood when it reaches the exploitability term, could be lost in the process of natural removal.

In terms of **economic perspective efficiency** (overall profitability), which can be determined only at the age of exploitability, this results from the different objective achieved by applying the various tending and management works of forests (regulation of inter- and intraspecific relations, improvement of sanitary and vegetation conditions, promoting the best specimens in terms of quality and value, etc.) which are translated, ultimately, through important economic benefits (Florescu, Nicolescu 1998).

The **periods and terms of exploitation** of wood for cleaning are provided in Annex no. 2 of the Order 606/2008. For the deciduous trees, the harvesting and collection period is allowed all year round (without restrictions).

Cleanings, as well as the release cuttings, are **expensive operations** and, for this reason, they do not cover the production costs. But there are exceptions in the areas where there is an unsaturated market for small-sized wood.

Therefore, that intervention is often considered an intervention work (where, because incomes are lower than costs, immediate economic effects are reduced), a fact that determined the development of some specific measures to limit their adverse economic effects, such as:

- **large distance planting**, when dense stand is achieved late and through which the obligation of cleaning intervention is removed;
- intervention with **partial cleaning**, if due to the economic calculi, results in more reduced production costs;
- intervention with **high intensity cleaning** when the dynamics of growth in diameter of the stand is intensified (some losses may appear at the

level of the total production) and the periodicity of works increases in parallel with the decrease of the intervention number on the same surface;

- application of **shelter-belt cleanings** (the case of the countries with an advanced silviculture and financial resources sufficient to afford such an intervention), works that create the premises necessary for the achievement of some qualitative stands in the future.

#### **MATERIAL AND METHOD**

The main factors influencing costs have been identified, demonstrating the influence of the volume to be extracted upon the costs of the tending works.

The costs are valid for 2011 and the calculi have been done according to the unified labor standards in the forest works (for Regia Națională a Pădurilor – Romsilva RA), respectively to the time legislation in Romania, in the plains and hills. The study was conducted on deciduous trees.

The intensity of the tending cuttings expresses the ratio of the amount of wood harvested from a stand by cleaning and thinning with respect to the total production of the stand and the age of exploitability. The intensity characterizes the practiced thinning regime determined by the intensity of each intervention and by their periodicity. Through the work performed during the cycle, a volume of by-products at least equal to the volume of trees that are removed in a natural way, that is about 30% of the total forest production, has been considered.

The intensity dosage for the thinning interventions during the lifetime of a stand represents a technical and economic aspect. There are two critical thresholds of works, as follows: one when they are not run when required, and in the case of some strong intensity, when the stand reaction is not the expected one. The intensity of the intervention is determined by species, age and environmental conditions.

**A.** Specimen cutting, collection, settlement in small piles that can be transported to the places between the remaining standing specimens

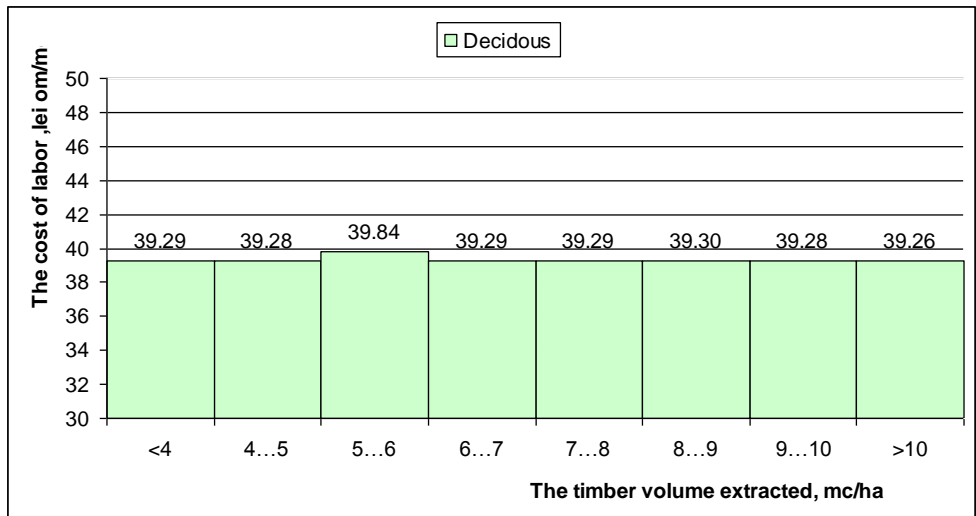


Fig. 1. Expenditure on cleanings in the plain and hilly area for the formation of small piles according to the timber volume extracted per ha, in lei person/mc

It is noted that for the deciduous forests, the costs with forming the small piles are not significantly influenced by the volume of timber extracted per hectare.

**B.** Collecting and stacking the wood resulting from cleanings (gathering the cut specimens and the branches resulted after sorting, transport on an average distance of 100m, placement near access roads, in typical piles)

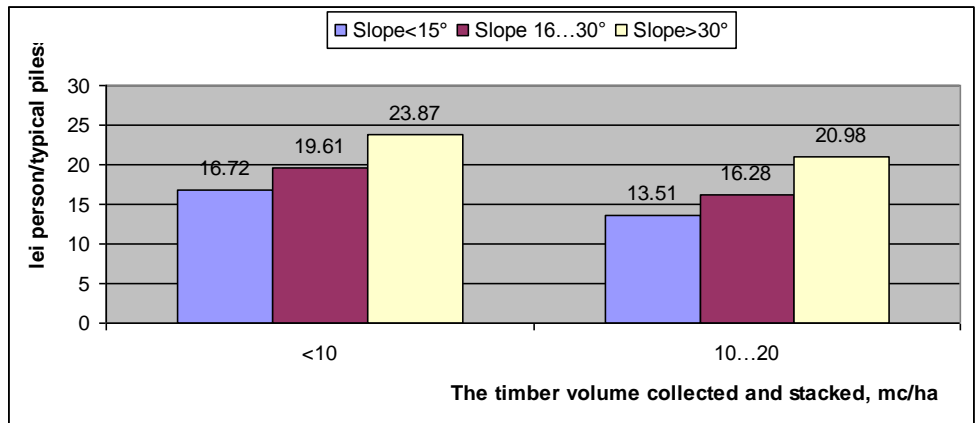


Fig. 2. Expenditure with cleanings for the formation of typical piles according to the collected and stacked timber per ha and to the slope, in lei person/mc

It is noted that there are significant differences (between 13-19%) between the cleaning costs for volumes to be extracted up to 10mc and volumes over 10mc/ha, less on lower slopes.

## CONCLUSIONS AND RECOMMENDATIONS

For tending works, it is important the stage of determining the factors that influence the choice of methods, means, harvest and gathering technologies to extract trees in relation to the resulting volume of timber, stand conditions, land orography, means and tools.

In this paper, the main factors influencing costs have been identified, demonstrating the influence of the volume to be extracted upon the costs of the tending works.

The results in Figure 3 were obtained by cumulating the values achieved at points A and B.

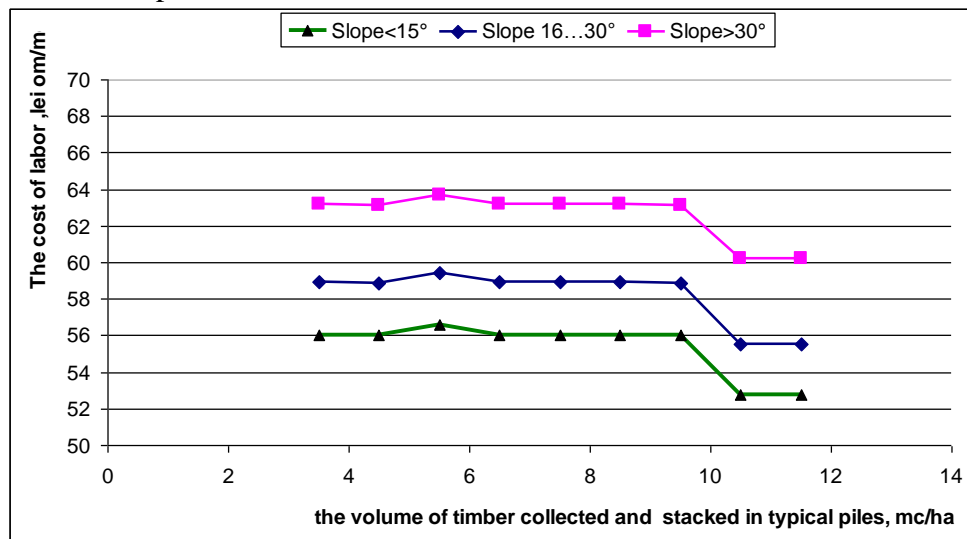


Fig 3. Total expenditure on cleanings in the plain and hilly area, depending on the volume of timber collected and stacked per hectare and according to the slope, in lei person/mc.

For the deciduous trees in the plains and hills, it is noticed in the figure below that the total of the expenditure decreases by approx. 7% for volumes to be extracted of over 10mc/ha.

### Recommendations

- establishing and enforcing the technical-organizational and economic conditions for the collection and use of resulted wood;
- recruiting and training the labor force, ensuring strict and permanent control and guidance throughout the execution of work etc;
- sorting the wood in the felling area / ramp / intermediate storage should be made more efficiently;
- if by-products are valuable, the measurement should be made with the gravimetric method or with the equivalent indices for a better accuracy

- giving up on tree scoring with a scribe when cleaning; simplifying and making more efficient the cleanings from an economic viewpoint, but the tree cutting should be performed under the strict supervision of a professional staff;
- the selection of those who perform the cleaning should be more rigorous on the classification of workers, equipment, tools: using modern and effective means, specific for this works;

The two sides of the economic efficiency, immediate and global, should be closely correlated, since, although the first interventions in the stand are unprofitable economically, they are crucial for managing the cultivated forests to increase its cultural and economic effectiveness. To this end, the improvement of the working technologies, the increase of the mechanization degree, the superior capitalization of the manufactured products have been considered, etc., but by no means, giving up the execution of some works that do not result in an immediate economic return, but are required for improving the structure, stability and productive and protective forest capacity.

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