

THE ECOLOGICAL RECONSTRUCTION OF THROUGH AFFORESTATION OF MONASTERY VALLEY DUMP WITH THE OF 226 HA, RESULTED BY THE SURFACE MINING.

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ABSTRACT

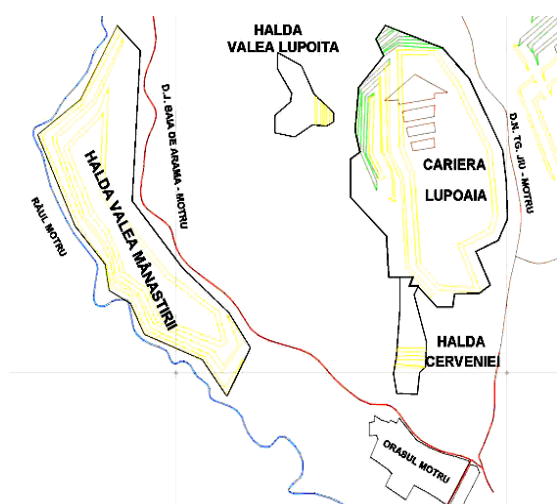
The Monastery Valey Dump has an area of 226 ha, the afforestation of this landfill was done in the autumn of 2009 using the afforestation composition 100 Sc (Salcâm – Robinia pseudacacia), the planting scheme: 2 x 1 (2 m between rows and 1 m between rows in a row). Before carrying out the afforestation works were carried out preparation of the land: the cutting of the grassy vegetation, on approximately 108 ha, the plowing of the land in the sections with low slope, the two-way discussion in the sections covered with plowing. installed the test markets of circular shape of 200 sqm, 226 test markets, in order to determine the catch percentage in the spring of 2010. The catch rate in the spring of 2010 was 77.63%, according to the inventory made in the test markets. Due to the drought during the summer, there were losses among the seedlings of about 10% of the planted area. During 2010, 2011 , 2012 and 2013 were carried out maintenance work of the plantations, consisting of two seedlings and a decomposition each year of vegetation. At the annual control, in the autumn of 2013, the success rate of the plantation was 56.4%. It should be mentioned that on the valley of the Monastery Valley, in micro-depressions, where the water is stagnant, the acacia tree became dry, and in its place were introduced into biogrups, species tolerant to the humidity demand: - ash - Fraxinus excelsior L., poplar white - Populus alba L., black poplar, cork - Populus nigra L. Although some plantations on these dumps studied are of the same age, the dimensions of these trees vary depending on the conditions of competition between individuals, depending on the biotic factors. and abiotics.

Keywords: dump, afforestation, acacia, ash, white poplar, black poplar

INTRODUCTION

The Monastery Valey Dump is situated on the radius of Cătunele commune, village of Monastery Valey, in the western part of the national road Motru - Baia de Aramă, about 5-6 km from municipality of Motru. This perimeter is an old dump, established, free of mineral loads, which in the western part is adjacent to the Motru river, and in the eastern part with the

village of Monastery Valey. it is located in the Getic Piedmont, more precisely in the northern part of the Strehaia Platform and the Jiu Platform, in the former meadow of the Motru river and on the first terrace of this river between 0% and 5%. The relief on this dump is very uneven, being the result of the up-to-date process of coal mining through excavation and dumping.



The Monastery Valey Dump is an old dump, stabilized, very non-uniform waste dump, with very well developed spontaneous vegetation. The central part of the objective is represented by a plateau, quite uneven with numerous depressive areas in which the water flows, but also nipples and heaps of waste. On both sides of the plateau there are slopes, with quite large inclinations, both towards east and west. The slopes range from 10% to 45%, and some higher than 45%. The western slope is in the form of steps, with steep areas, interrupted by areas with slope delays in the form of small terraces. The eastern slope is more uniform, with slopes from 25% to 35%, with an eastern slope. The inclined areas are covered by numerous rows, determined by the water from the precipitation. Following the development process, the surface of the improvement perimeter of Monastery Valey was perfectly connected with the relief in the area. The slopes turned into uniform slopes with slopes up to 18%, with the inclination to the east and west. It is compulsory to consider the water management, so as not to produce surface erosion phenomena and / or depth. All these materials, in the form of alternating layers, are made up of Piedmont deposits, represented by

meotian, ponatian materials and in smaller quantity dacians (sands in a very small percentage), materials that come from the Motru' hills. We can affirm the fact that from the geological and lithological point of view, Monastery Valey Dump is very complex, geological materials of different ages, resulting from the process of daily exploitation of the coal, these being deposited in the dump in a completely random way. In the dump there are mixed heterogeneous clay, clays and in a smaller percentage of sands. All these rock mixtures, which differ in geological age, nature, grain size, are lacking in fertility or have a rather low fertility, fertility that is exhausted in a very short time. Due to the above things mentioned the possibility of this perimeter of improvement at recultivation is very different. The Monastery Valey Dump, from a hydrological point of view, is part of the basin of the Motru river, of which it is also bordered in the western part. The hydrological aspects that influence the area more or less are represented by rainwater and groundwater. Water from rainfall can adversely affect the perimeter, by leaking on sloping surfaces and may cause erosion, first by surface and then by depth.

In the micro-depression areas the predominant fine lithological materials predominate, the water from the rainfall has accumulated in the form of smaller or larger ponds. The groundwater is found at depths greater than 10 m and cannot influence the solubilization power. On the other way it influences negatively on the water supply of a grassy and woody vegetation, at this depth being inaccessible to the root system.

For the climatic characterization of the area there were used data from Tg. Jiu weather station. From the climatical

point of view, this zone extends into the c.f.b.x. climatic province, with a temperate continental climate, with mild winters and warm summers, with sufficient rainfall, but non-uniformly distributed, abundant during the autumn and spring, but deficient during the summer. The spontaneous vegetation is good installed, there can be found species as: palamide (*Cyrsum arvense* L.), hornbeams (*Xantium strumarium* L.), corn colts (*Tribulus terrestris* L.), wind grass (*Aspera spica-venti* L.), mohor (*Setaria viridis* L.), the tail of the horse (*Equisetum arvense* L.), especially in the micro-depression areas, where the water flows. Frequently, on the Monastery Valey Dump, young species of poplar and willow are isolated, especially in the micro-depression areas, where the water is flowing. Also in these areas there can be found species like the reed (*Phragmites australis*), the parrot (*Acorus calamus* L.) and the whip. The installation of spontaneous and good vegetation can begin then, later it is liturgical material. The anthropogenic influence on Valley of the Monastery dump is very evident in putting into full force and effect that was imprinted on the environment through the up-to-date exploitation of coal, the initial appearance in the natural environment was radically transformed through important transformations that take place in all the lithosphere, pedosphere, biosphere and atmosphere. Following the excavation and then the sterile deposits, many convex or concave shapes appeared, that conducted to the modification of the initial relief. The most serious aspect of the mining exploitation may be in the removals from the productive circuit, also agricultural and forest circuit of a great land area and at the same time reducing the production capacity of adjacent land. The most important

important transformations for the inhabitants of the areas with lignite reserves and minor exploitation to date, consist of the destruction of the necessary localities, of the way of communications, of agricultural lands and forests, a supply of drinking water, the change of river courses, air pollution, noise sources.

MATERIAL AND METHOD

Due to the heterogeneity both horizontally and vertically, the welded materials create great problems in the reconstruction process, because the cultural measures cannot be differentiated for each type of material, due to the small uneven surfaces and with different treatment that are needed. On this heap among the clay, sands and clays there can be found heterogeneous fragments smaller or larger of carbonaceous material, mixed inhomogeneously with lithological materials.

The Monastery Valey Dump has an area of 226 ha, the afforestation of this landfill was done in the autumn of 2009 using the 100 Sc afforestation composition (Salcâm –*Robinia pseudacacia*), the planting scheme: 2 x 1 (2 m between rows and 1 m between rows in a row). Before carrying out the afforestation works were carried out preparation of the land: the cutting and cutting of the grassy vegetation, on approximately 108 ha, the plowing of the land in the sections with low slope, the two-way discussion in the sections covered with plowing. There were installed the test markets of circular shape of 200 sqm, 226 test markets, in order to determine the catch percentage in the spring of 2010. The catch rate in the spring of 2010 was 77.63%, according to the inventory made in the test markets. Due to the drought during the summer, losses were found among the seedlings of about 10% of the area planted. During 2010, 2011, 2012 and 2013,

maintenance work was carried out on the plantations, consisting of two seedlings and a clearing each year of vegetation. At the annual control, in the autumn of 2013, the success rate of the plantation was 56.4% It should be mentioned that on the Monastery Valley dump, in micro-depressions, where the water is stagnant, the acacia tree has dried up, and in its place have been introduced into biogroups, species tolerant to the humidity demand:

- ash - *Fraxinus excelsior* L.;
- white poplar - *Populus alba* L.;
- black poplar, cork - *Populus nigra* L.
- trembling poplar - *Populus tremula* L.

RESULTS AND DISCUSSIONS

The researches were carried out on sample surfaces of square shape, having the area of 200 sqm. The materialization of the test surfaces was done both on the flat forest land (plateau) and on the wooded slope. In each sample area, measurements were made regarding the diameter and the height of the entire shaft. Although some plantations on these dumps studied are of the same age, the dimensions of these trees vary depending on the conditions of competition between individuals, depending on the biotic and abiotic factors.

The data regarding the percentage of catch and the annual control on the Monastery Valey Dump, 226 ha

Table no.1

The catch percentage at the entrance in vegetation (%)	Halda Valea Mănăstirii 226 ha			
	Success rate at annual control (%)			
	I Year 2010	II Year- 2011	III Year - 2012	IV Year 2013
77.63	74.2	68.4	62.2	56.4

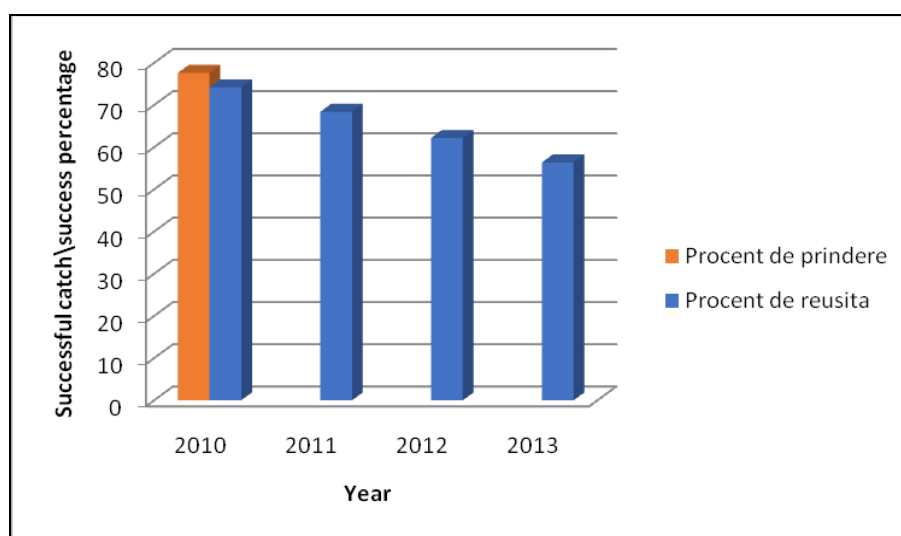


Figure no.1

The percentage of catch and success on Monastery Valey Dump 226 ha

Distribution of trees by diameter categories

Tabelno.2

Categories of diameters (cm)	< 2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	Total
Number of trees on surface 1 - versant	3	11	21	18	20	2	1	1	77
Number of trees on surface 2- versant	0	10	18	20	18	5	2	0	73
Number of trees on surface 3- versant	1	5	36	38	5	3	0	0	88
Number of trees on surface 4 - platou	0	8	8	15	26	24	1	0	82
Number of trees on surface 5- versant	0	11	12	28	32	1	1	0	85
Number of trees on surface 6- versant	1	5	15	8	28	31	1	0	89
Number of trees on surface 7- platou	0	8	9	10	24	26	0	0	77
Number of trees on surface 8- versant	1	5	11	7	23	31	2	0	80
Number of trees on surface 9- platou	0	3	15	28	22	2	1	0	71
Number of trees on surface 10- platou	2	10	11	24	26	1	2	0	76
Number of trees on surface 11- versant	1	17	25	22	18	2	2	0	87
Number of trees on surface 12- versant	0	8	15	24	25	5	1	1	79
Total trees per 2400 mp	9	101	196	242	267	133	14	2	964
Total trees per hectare	37	420	815	1007	1111	553	58	8	4009

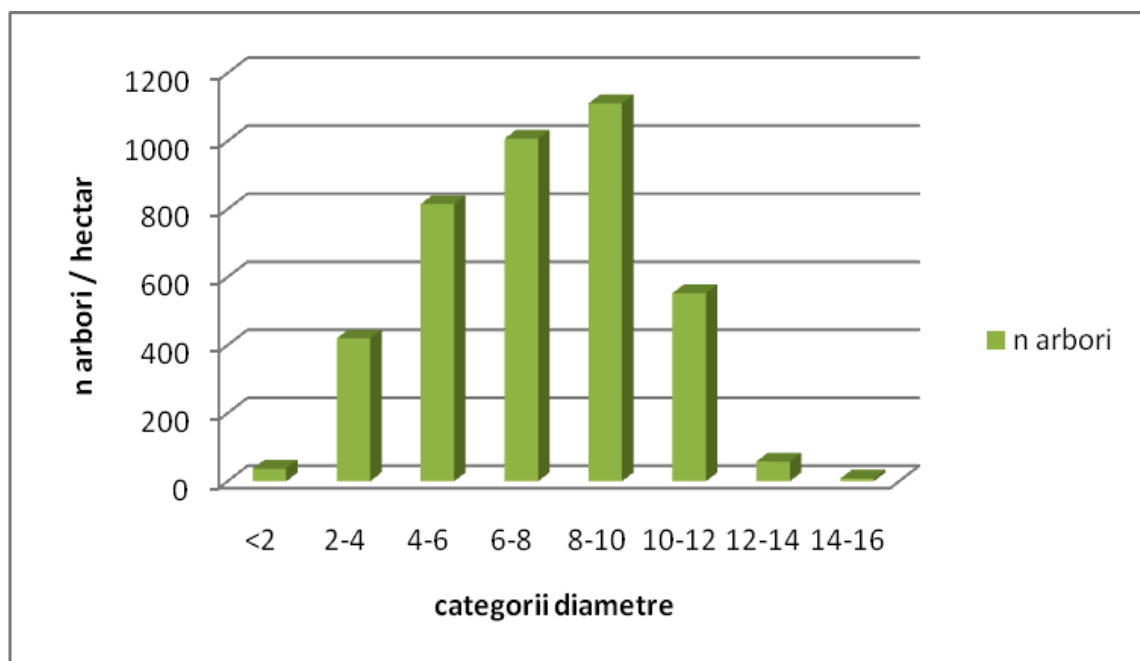


Figure number 2

The distribution of the number of trees by category of diameters on Monastery Valey Dump

**The taxonomic characteristics of the crops on Monastery Valey Dump
Culture at the age of 5 years**

Tabelno.3

The number of trial surface	Dgm (cm)	Hm (m)	Volume average tree (m.c)	Number of the trees at the test surface
1	11.4	10.5	0.061	77
2	8.5	9.2	0.027	73
3	7.9	8.4	0.025	88
4	10.2	9.8	0.043	82
5	9.33	9.5	0.029	85
6	11.23	9.8	0.045	89
7	11.1	9.4	0.044	77
8	11.42	9.8	0.046	80
9	8.23	8.1	0.025	71
10	8.6	8.5	0.027	76
11	8.2	7.6	0.023	87
12	8.72	8.2	0.031	79

Figure 3 shows the statistical dependence between the average diameter of the respective category and the average height of the trees in the same diameter category for the Monastery Valey Dump.

Datele obținute prin măsurare directă și mediere sugerează o dependență de tip pătratic și s-a ales tot tipul de curbă recomandat de V. Giurgiu în anul 1966 – o parabolă care trece prin origine. Din figură se observă că parabola aleasă ajustează foarte bine norul de puncte ce caracterizează vegetația de pe halda Valea Mânăstirii. Se observă o tendință medie de stopare a creșterii în înălțime a arborilor când aceștia înaintează în vârstă, se produce un declin fiziologic datorită prezenței carbonaților în materialul haldat. The data obtained by direct measurement and mediation suggest a quadratic type dependence and also was chosen the type of curve recommended by V. Giurgiu in 1966 - a parabola passing through origin. From the figure it is observed that the chosen parabola adjusts very well the

cloud of points that characterizes the vegetation on the valley of the Monastery Valley Dump. An average tendency to stop the growth in height of the trees is observed when they grow older, there is a physiological decline due to the presence of carbonates in the dump material.

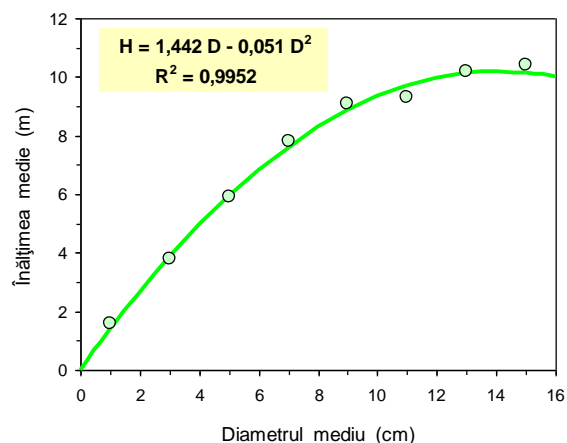


Figure no.3

Second degree regression curve estimating dependence stochastic between the sample surface (D) and the average height of the average diameter of the trees (H) on the Monastery Valey Dump.

CONCLUSIONS

From the research carried out and materialized in the presented graphs and field observations from Halda Valea Mânăstirii, the following conclusions are drawn:

The best results in the forest recultivation on Monastery Valey Dump were obtained with *Robinia pseudacacia* L. - acacia.

Populus tremula L. - trembling poplar is a species that supports the heat well, but not the excessive drying. It prefers the lands in the slope, with normal humidity regime. In areas where the waste material is richer in nutrients, it is better vegetated, it is a eutrophic, mesophyte - eurifite species and even with euriedafic inclinations (Șofletea N., Curtu L., 2008).

In areas subject to dryness, such as those formed on sandstone, it is rarely or completely missing.

It is a rustic species, with active growths in youth, with fruiting and dissemination capacity, it can be introduced without major restrictions on the waste dumps, being considered a pioneer species.

Fraxinus excelsior L. - ash, common ash is a species that is found from the Mediterranean to the boreal regions. However, it is affected by the late frosts, which catch the terminal buds started in the vegetation. The terminal buds open faster by about two weeks than the lateral ones, which leads to frequent truncation of the trunk (Șofletea N., Curtu L., 2008).

The ash was installed on the waste material, in areas well supplied with water, even hydromorphs, where the water swings, but not for a long time, showing the tendency to abandon the dissemination species status, forming pure trees, a tendency is noted ashes.

It is a species pretentious to the content of the soil in exchange bases. It has a light temperament, in the first 5-6 years it supports relatively shading, so that, as it ages, it is more demanding to light (Șofletea N., Curtu L., 2008).

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