

THE ECOLOGICAL RECONSTRUCTION THROUGH AFFORESTATION WORKS ON THE RUNCURELUL DUMP HAVING THE AREA OF 27 HA

DINUCĂ NICOLAE CĂTĂLIN, BERCEA IULIAN

University of Craiova, Faculty of Agronomy, catalindinuca@yahoo.com

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ABSTRACT

In recent decades, surface mining operations, especially in the mining basin of Oltenia, have developed a lot and as a result there have been large areas with degraded land and tailings dumps whose ecological reconstruction has been and is a topical issue.

The Runcurelu Dump is located within the Jilț Quarry, the territory of commune Mătășari, more precisely in the Runcurelu meadow and is free of technological tasks. The spontaneous vegetation settled quite well, especially on the first plateau. Because the piled material was deposited in a completely random way, the surface of the perimeter is largely uneven, especially on the two slopes that border the plateaus. On the slope the slope is large and complex, ranging between 25-35% and over.

From a geological point of view, the studied perimeter is very complex, belonging to both the Pliocene (Levantine) and the beginning of the Quaternary and Dacian (sands).

Lithologically, it is represented by various inhomogeneously mixed geological materials. Following the coal mining process, respectively the dump process, the geological deposits of a great diversity were brought up to date and mixed very heterogeneously.

The diversity of dumped materials is observed both chemically and physically. In this dump are alternately deposited all sorts of materials, from clays, marls, to sands with smaller or larger coal fragments.

INTRODUCTION

Runcurelu Dump is located on the territory of Mătășari commune, located in the northern part of the Getic Piedmont. This dump was formed in the meadow area of the Runcurelu valley and includes two plateaus in steps bordered by slopes. The first plateau is quite uniform, with a slope of 2-5%, having a width between 300-400 m. This plateau is bordered around by a steep slope, with a slope greater than 25%. In the northern part of this plateau the piled materials were deposited in the form of strings, forming a slope of 5-10%. Within this plateau it was deposited sterile on a certain surface, forming a new more or less uniform platform, with a slope between 2-10%, the surface being delimited by a slope with a slope of over 25%.

Spontaneous vegetation settled quite well on the dump. Among the plant species we can list: *Cynodon dactylon* L., *Vicia sativa*, *Equisetum arvense* L., etc. In the area the woody species are represented by: *Quercus petraea* L., *Quercus frainetto* Ten., *Quercus cerris* L.

The existing lithological materials in the dump are part of the group of materials with medium fertility potential, which can be seen by the presence of spontaneous vegetation installed here.

The existing materials in the dump in the form of alternating layers exceeding 1.5 m represent the future technogenic soil, their properties having a special role in the evolution of artificial soils, but especially in the speed of pedogenetic processes.

The following pedogenetic factors will play an important role in the solification process:

- plant and animal organisms.

- rock (piled lithological materials).
- the relief created as a result of the arrangement.
- groundwater, rainwater, stagnant.
- solidification time.
- the productive activity of man.

The materials deposited in the dump have undergone an advanced mechanical crushing and contain various chemical elements, which makes it possible to develop a diverse spontaneous vegetation and crops that do not have a large production capacity or quality.

Fertility, the basic characteristic of soils, is part of a biological circuit, as opposed to the fertility of rocks in dumps, which is part of the biological circuit of substances.

MATERIAL AND METHOD

On Runcurelu Dump with an area of 27 ha, afforestation works were carried out using the afforestation composition 100 Sc (Acacia - Robinia pseudacacia L.) in 2008.

In this breeding perimeter was carried out the afforestation of areas prone to grazing with hedgerows - Gleditsia triacanthos L., with the fruit a very large pod, sometimes 30-40 cm long, and the vines have long thorns and is used to protect plantations forestry against grazing.

For the integral afforestation with acacia, the planting scheme 2 mx 1m (2 m between rows and 1 m between seedlings per row) was used, and for the execution of afforestation works for the

fencing fence the scheme of 40 cm x 40 cm was used, with three rows of seedlings.

After planting, the sample markets of circular shape of 200 sqm, 27 sample markets were installed, in order to determine the percentage of capture in the spring of 2008, according to the technical norms regarding the annual control of regenerations.

Until the closure of the massif state, soil mobilization works were carried out around the seedlings (prairie I), executed in hearths of 60 x 80 cm on the entire surface during May-June of each year of vegetation and prussila II, executed in hearths of 60x80 cm on the whole surface, during July-August, every year of vegetation.

RESULTS AND DISCUSSIONS

In the spring of 2008, the catch percentage was determined, which was 82.0%, according to the inventory in the permanently located sample markets, until the closure of the massif state.

In the autumn of 2008, works were completed to fill in the gaps for the admissible technological losses, but these works were not highlighted when completing the doctoral thesis.

Between September 15 and October 15, the annual control of regenerations was carried out, the second stage and a success rate of 78.5% was found.

In the years 2008, 2009, 2010 and 2011, maintenance works were done on the plantations, hoeing and clearings.

Percentage of rooting dump Runcurelu -27 ha, considering the year

Tab. 1

The catch percentage at the entrance in vegetation (%)	Runcurelu Dump - 27 ha			
	Success rate at annual control (%)			
	I Year 2008	II Year- 2009	III Year - 2010	IV Year 2011
82.07	78.5	73.2	69.2	65.2

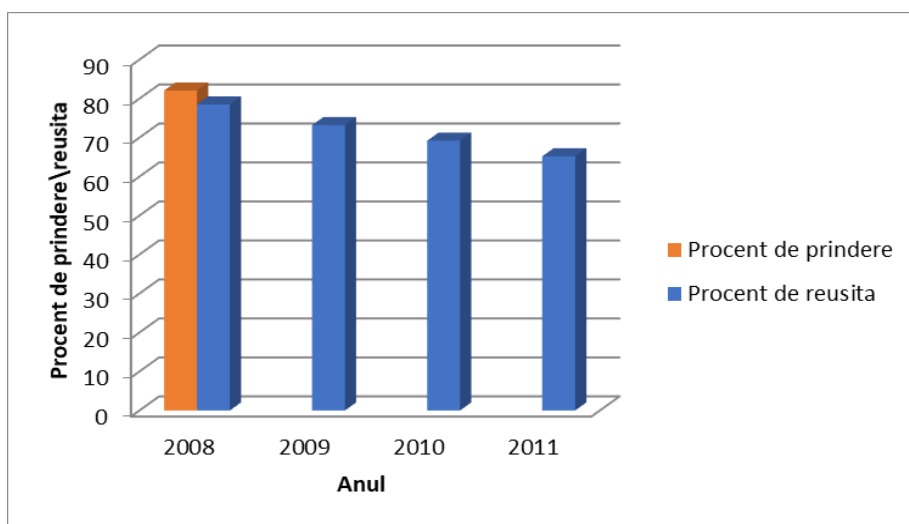


Figure 1. Rooting and succes rate on Runcurelu dump

Table number 2 presents the situation of the acacia crop inventory, respectively the distribution of the number of trees by

diameter categories resulting from the 2014 inventory.

Distribution of the number of trees, considering diameter

Tab. 2

Categories of diameters (cm)	< 2	2-4	4-6	6-8	8-10	10-12	12-14	Total
Number of trees on surface 1 - versant	4	12	28	25	5	2	0	76
Number of trees on surface 2 - versant	6	10	22	30	8	1	0	77
Number of trees on surface 3 - versant	5	10	24	33	7	3	1	83
Number of trees on surface 4 - versant	2	15	30	22	4	1	0	74
Total trees per 800 mp	17	47	104	110	24	7	1	310
Total trees per hectare	213	588	1300	1375	300	88	13	3875

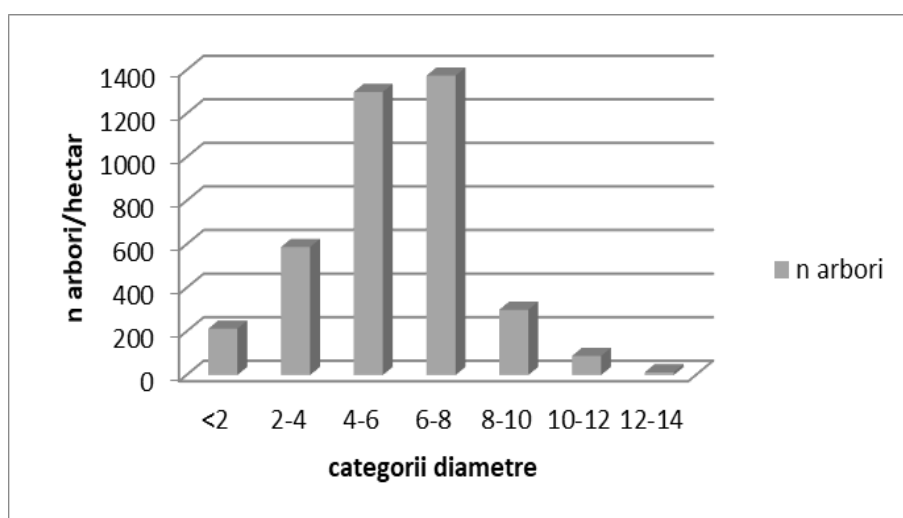


Figure. 2 Runcurelu dump 27 ha - Distribution of the number of trees considering diameter

Dimensional characteristics of crops on Runcurelu dump, at the age of 6 years.

Tab. 3

Number surface trial	Dgm (cm)	Hm (m)	Tree medium volume (m.c)	Number trees to the sample surface
1	7.7	6.2	0.021	76
2	7.8	6.4	0.021	77
3	8.1	6.8	0.023	83
4	7.5	5.8	0.021	74

Figure 3 shows the stochastic dependence between the average diameter of the respective category and the average height of the trees in the same diameter category for the Runcurelu dump.

A second degree polynomial function whose free term is zero was chosen as a regression function. This quadratic function has been

recommended by V. Giurgiu since 1966 to express the variation of average heights in relation to average diameters and has the property that its graph passes through the origin of the coordinate axes. The figure shows that the regression equation established for the Runcurelu dump well adjusts the data obtained by direct measurements.

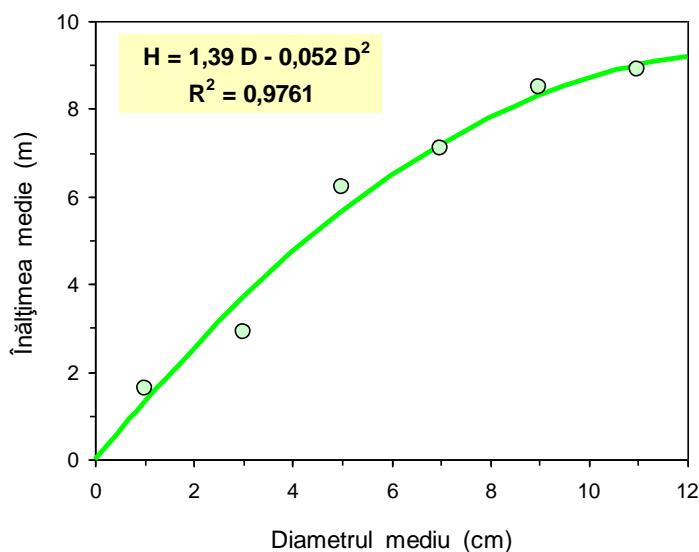


Figure. 3 Parabolic regression curve that estimate the stochastic dependency between mean diameter (D) and the average height of the trees (H) on Runcurelu dump.

CONCLUSIONS

The best results in forest cultivation on Halda Runcurelul were obtained with Robinia pseudacacia L. - acacia.

Populus tremula L. - trembling poplar is a species that tolerates heat well, but not excessive dryness. It prefers sloping soils with a normal humidity regime. In areas where the dumped material is richer in nutrients, it vegetates better, it is a eutrophic, mesophytic -

eurifitic species and even with euriedaphic inclinations (Șofletea N., Curtu L., 2008).

In areas subject to drought, such as those formed on sandstones, it is very rare or completely absent.

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

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

The ash was installed on the piled material, in areas well supplied with water, even hydromorphic, where the water puddles, but not for a long time, manifesting the tendency to abandon the status of dissemination species, forming pure stands, there is a tendency of ash.

It is a species demanding to the soil content in exchange bases. It has a light temperament, in the first 5-6 years it bears relatively shading, so that then,

with age, it is more pretentious to light (Șofletea N., Curtu L., 2008).

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