

# AFFORESTATION OF THE DEGRADED AREA FROM THE CERNA OF OLTET BASIN

## ÎMPĂDURIREA TERENURILOR DEGRADATE DIN BAZINUL CERNEI DE OLTET

RĂDUȚOIU D.<sup>1</sup>, RĂDUȚOIU AMIRA<sup>2</sup>

<sup>1</sup>University of Craiova, Faculty of Horticulture,  
Biology Department, Romania  
<sup>2</sup>Primary School Filiași

**Abstract.** *The Cerna of Olteț Basin is situated in the South-West part of Romania, incorporated in the Getic Benchland (178 m), in the Oltenia sub-Carpathian depression and in the mountainous region (inferior, intermediary, and superior) (2100 m). The afforestation of degraded terrain in the territory that is being analyzed has been differentiated according to the type of terrain. From this category of degraded terrain within the territory, have been included the slippery and the antropically degraded ones (burrows and the banks of the main courses of water within the basin).*

**Rezumat.** *Bazinul Cernei de Olteț este situat în partea de sud-vest a României și se încadrează la partea superioară a Piemontului Getic (178 m), depresiunii subcarpatice a Olteniei și regiunii montane (inferioare, mijlocii și superioare) (2100 m). Împădurirea terenurilor degradate din teritoriul cercetat s-a făcut diferențiat în funcție de tipul de teren. Din categoria terenurilor degradate, în teritoriul cercetat au fost incluse terenurile alunecoase și cele degradate antropice (haldele miniere și malurile principalelor cursuri de apă din bazin).*

**Key words:** afforestation, Cerna of Oltet Basin.

### INTRODUCTION

In order to increase forests' productivity and to avoid land slides in certain areas from the analyzed perimeter, forest vegetation is needed through works of afforestation, which make possible the expansion of rapid growth species, recovery of barely productive arboreta, and the use of special cultures of great performance.

In uncovered areas in the forest perimeter, woody vegetation can emerge and expand naturally, without any kind of human intervention.

In the old forest, exploited or destroyed from whatever the cause, the trees are generally replaced by a new generation.

Forests within the researched are that are exploited for wood are naturally or artificially regenerated. In the case of natural regeneration, the new generation is obtained from the seeds spread after the exploitation cuttings, and when natural regeneration is not possible or advantageous economically, afforestation is being done with the help of saplings from the same species or, seldom, with saplings from different species.

The afforestation of antropically degraded terrains is a necessity, because, this way, catastrophes with devastating consequences can be avoided. A series of factors must be considered for the afforestation of these terrains: the type of soil, soil humidity, area of vegetation where these surfaces are, exposure and degree of inclination of the terrain etc.

## **MATERIAL AND METHOD**

Starting from bibliographical information we repeatedly studied the area conform to the method of itinerary as the surface was very large, but when necessary we used the method of stationary and detailed our analyses collecting and preserving the floristic material.

## **RESULTS AND DISSCUSIONS**

Afforestation has been performed differently, according to the type of terrain and the area or layer of vegetation where the forest area is.

### Afforestation of slippery terrains

Land slides are degrading phenomena present in some locations of the researched territory (Dejoi, Nisipi and Fârtățești) (Fig. 1). They consist of the detachment and displacement of masses of earth, the main cause being the combined action of gravity and infiltration waters.



**Fig. 1.** Terrain sliding in the locality Fârtățești

They usually take place on high inclination terrains, and appear as a consequence of fissures within the terrain around the area where the land slide phenomenon is produced. This type of slide has led to the destruction of the district road in the locality of Dejoi.

The most efficient measure of prevention regarding land slides is afforestation, because the forest, through its trees' crowns retains large quantities of water from rains, great part of which evaporates directly into the atmosphere, without falling onto the ground and, thus, not infiltrating in it. Secondly, the forest consumes great quantities of water from the ground, reducing the risk of it becoming dump, and thirdly the roots of the forest trees constitute the live reinforcement that fixes the sliding land strata.

In the Dejoi locality, where the land slides occurred, concrete dams have been made, but they later proved useless. This is why the use of forest vegetation in the consolidation of these terrains remains one of the most efficient and less costly methods.

Also, through the afforestation of sliding lands important direct revenues are obtained. First, there is a supplementary wood mass production, as a result of the entry of these terrains in the production circuit.

When choosing the species, the climate and edafic conditions are taken into consideration, so that the selected species give the best output regarding the desired aim.

By using certain species in the afforestation of certain degraded terrains there results a special melliferous basis for the local apiculture. Also on the degraded terrains cultures of fruit-bearing trees can be started, as basis of raw material in the food industry.

Other species used for the consolidation of these terrains are: *Robinia pseudoacácia*, *Quercus robur*, *Salix álba*, *Salix frágilis*, *Fráxinus órnus*, *Cérasus ávium*, *Elaeágnus angustifólia*, *Júglans régia* as well as bushes of *Córnus mas*, *Cornus sanguínea* and *Ligústrum vulgáre*.

The observations made on the slippery terrains of the Cerna de Olteț Basin show the positive evolution of the majority of these terrains as a result of the afforestation works, the global efficiency of these works generally being high.

It has been noticed that the process of stabilization of slippery masses starts only 5-6 years after the initiation of the culture, in the case of species with a rapid growth (locust tree, oleaster, alder), and after 8-10 years in the case of those with a slower rhythm of growth during the first period after the planting (black pine, ash tree, etc).

We can thus say that slippery terrains are the expression of gravitational disequilibrium, and their emergence is conditioned mainly by the nature of the lithological substrata. The maximum expansion of land slides has been registered for the alternation of sands with clay and marl where the index of affectation for active slides is a lot lower for forests in comparison with the degraded pastures.

The forest ensures to the greatest extent possible the prevention and damming of slide processes. Together with adjacent works meant to prepare the terrain, consolidation and support for the slopes, has got great efficiency in the gradual stabilization of slippery terrains and in their capitalization.

Slippery terrains present a pronounced homogeneity from the ecological characteristics point of view, and of the productive potential for the forest vegetation.

#### Afforestation of antropically degraded terrains

In many cases the terrain degradation processes caused by natural factors such as water coming down the slopes, or the wind where erosion processes are involved, water excess in the soil, gravity together with infiltration water – the case of land slides. To these, man, through his activity, has favored or diminished the erosion action of water, without directly intervening in the terrain degradation process.

There are nonetheless situations when, through the activities they perform, men directly lead to terrain degradation, respectively destroying or diminishing the production capacity of the soil. Through human activities that lead to terrain degradation, are those related to mining exploitations, construction of road transport installations (Copăceni), setting and functioning of different industrial installations (Lăpușata) etc. In all of these cases, the fertile soil is being destroyed or removed, manually or with machines (bulldozers, excavators, etc), or is being covered with different kinds of debris, without, or with very low, fertility.

Mining burrows afforestation. This type of burrows is found within the Cerna de Olteț Basin in the area of the Copăceni locality. They are a result of surface exploitation for coal.

The majority of these terrains present on their surface fine materials that are easily blown away by the wind and deposited on fertile terrains, gardens and orchards. The necessity for afforestation is the more acute, as their presence is in the vicinity of human settlements. Apart from their unaesthetic aspect, they are continuous sources of dust inside homes, especially during windy or stormy days.

For these reason the problem of fixing and planting within the mining burrows is a social necessity. Covering them with useful vegetation solves not only the problem of deposit consolidation and redoing the landscape, but also finding good use for sterile soils.

These burrows, located in Copăceni, offer very difficult stationery conditions for vegetation. This is why, in many cases, authorities in charge have first realized amelioration works that allowed for forest vegetation and ensure its proper development.

The burrows, with slopes of 10-15° inclinations, and which had a reduced degree of stability, have been consolidated by construction works. In many cases the deposits have been very set. This is why the soil loosening has been the main condition for forest vegetation plantation.

The planting of woody species has been made in holes where humiferous soil has been added. During the first years these plantations have been watered,

because of the draughty periods that followed, the water necessities of the trees not being met.

In the afforestation of the burrows good results have been obtained for the *Pinus nigra* (Fig. 2), *Robinia pseudoacacia* and *Betula pendula*.



**Fig. 2.** Afforestation of the mining dump from the locality Copăceni

#### Afforestation of the banks of the main water courses within the basin

The banks of the main water courses of the researched territory are also part of the antropically degraded terrains category. They are constantly subject to degradations. The main factors that contribute to their degradation are: rains, water currents, rodents, worms, etc.

The consolidation of water course banks was realized with the help of construction works (protection dams made with rock closed with wire), around the localities of Stroești, Slătioara, Dejoi and Copăceni, and with the help of herbaceous and woody vegetation in the localities of Oteteliș, Stănești, Stroești and Slătioara). There are cases when the woody vegetation appeared naturally on the water banks, efficiently contributing to their stability. (Oteteliș, Valea Mare, Dejoi, Nisipi, Lădești and Stroești).

Among the species widely used for this type of works, we mention: *Salix álba*, *Salix frágilis*, *Pópulus x canéscens*, *P. nígra*, *Álnus glutinósa*, *Fráxinus pallisiae* etc.

To conclude with, we can say that forest vegetation together with construction works represent much more efficient and durable consolidations, than the construction works alone (especially where the water courses have a curvy downfall).

## CONCLUSIONS

As a result of the research done on the site, we can say that on slippery soils *Robinia pseudoacácia*, *Fráxinus órnus*, *Cérasus ávium*, *Córnus sanguínea* and *Ligústrum vulgáre* are successfully used; on antropically degraded soils *Pínus nígra*, *Robinia pseudoacácia* and *Bétula péndula*; and in the river deltas within the basin, poplars, willows and alders, because they are resistant to floods, are easily assimilated, and grow rapidly when offered the optimum conditions.

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