Improvement works in Steierdorf perimeter to increase of ecological value of degraded lands

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Abstract

The perimeter improvement meets anthropogenic degraded lands through spoil mounding with sterile raw resulting from mining activity. These lands are unproductive, have an unaesthetic, affecting the beauty of landscape, and are sources of pollution to adjacent land and nearby waters by washing taluses, and movement of soil particles by wind infertile. In order to improve current conditions, an area for improvement, designed to bring those lands into production.

Key words

anthropogenic land degradation, pollution, afforestation works

Anthropogenic land degradation is the result of natural resources use [exploitation], which constitute planned human actions, necessary and useful for the development of natural resources use.

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Material and Method

To describe and characterize the categories of degraded lands we adopted Ciortuz and Pacuraiu's general scheme of station classification, called unitary station method of assessment of degraded lands.

Steierdorf perimeter improvement, is located outside the Anina city, close to Steierdorf neighborhood, with a cumulative area of land degraded by 71.10 ha.

Improvement the perimeter falls under the submediterranean climate, Banat region of hills and high plateaus in the climate with the coldest temperatures around -3 °C in the coldest months and months in the warm 18 °C Characteristic hilly area at altitudes of 400 -700 m.

Anina Mountains by their geographical location, is in the masses of moist maritime air of Mediterranean origin, in the area delivering large amounts of rainfall, well above the average in other areas at the same altitude. Thus, Anina at 588 m altitude, falling on average 1037 mm rainfall annually.

A. Anthropogenic degraded lands:

a) Degraded land resulting from the rocks by explosion rocks the height of 1.5 - 3.0 m width and 2.0 - 2.5 m. In this way, the abrupt valley side were formed steps with lengths of 200 - 600 m and width of 2.0 - 2.5 m distance between gears is averaging 20 m. On the stairs is a layer of 3 - 18 cm of gravel mixed with soil transported from the slope, with higher thickness (18 - 22 cm) at the upstream and downstream of the lip, on which was installed on there and pioneer vegetation, consisting mainly of goat willow, poplar, hornbeam, elm. These lands are held in the site type S1, with site formula: XI1M1a.

b) Taluses of steps - are degraded by burial layers of topsoil under gravels and rubble lands thrown over them by explosion, caused by erosion of the rock fragments and gravels by rolling, the continued leakage of pluvial. The slopes of taluses steps are 35 - 45 °. These lands fall within the site type S2, with site formula: XII1Y3a. In areas with less pronounced slope, the point where it found traces of soil were installed pawns species (goat willow, poplar, eastern hornbeam, elm), especially on base of taluses.
Potato leaf virus X virus M strains used were: Potato virus A - PVA (A), Potato virus M - PVM (M), Potato virus S - PVS (S), Potato virus X - PVX (X), Potato virus Y - PVY (Y) and Potato leaf-roll virus - PLRV (L).

b) Degraded lands through spoils consisting of stones of different sizes, from the cliffs of gravels of 0.3 - 0.5 cm, with pieces of soft marl schist, clays and earth. Form bross or strings on surface of spoil mounds. When the land mass is made larger, they have appeared on copies of forest species, especially species pawns. Otherwise, the land is devoid of vegetation, these lands are included in the site type S4, with the site formula: X2W12b.

b) Degraded lands consist of cruk along riverbeds by clogging materials occur taluses transported on roads and spoil mound. Are areas with cruel soil, accumulation of alluvia, generally very skeletal, which has developed a feature herbaceous vegetation characteristic moist soil and forest species characteristic of meadows, which is missing, however, alder. These lands are held in the site type S5, with the site formula: XII1Y6b.

The biological material used in this study was represent ted by potato plants infected with six virus strains and four mixed infection combinations. The potato plants belong to four Romanian potato cultivars. Data presented and discussed in this study represent the mathematic average between the results obtained for all cultivars. This research wants to show virus strain importance in virus eradication system. The virus strains used were: Potato virus A - PVA (A), Potato virus M - PVM (M), Potato virus S - PVS (S), Potato virus X - PVX (X), Potato virus Y - PVY (Y) and Potato leaf-roll virus - PLRV (L).

Thermotherapy with 31°C (night) and 36°C (daylight) was applied to the donor plants for 10 weeks before meristems excision. Shoots from meristems were regenerated on PM basic medium added with indole-3-acetic acid (1mg/l) and indole-3-butyric acid (1mg/l), kinetin (0.05 mg/l) and gibberellic acid (0.3 mg/l). Regeneration percentage and other statistical parameters were calculated in order to interpret correctly the results obtained.

Afforestation works

Particulars of land make the afforestation of degraded lands silvotechnica a special technique, which requires special consideration in the choice of species and the establishment of schemes and formulas blend. Given the ecological requirements of species and stand type were chosen for the Anina perimeter following wood species: white pine, aspen, spruce, larch, birch, ash, and shrubs of the species chosen to bat.

Results and Discussions

To the land of the S1, with the site formula: XII1M1a which is characterized by alluvial land covered with alluvial soil weak was adopted formula 30% Aspen 50% Ash 20% Spruce, whereas the soil was prepared in Vetra, and these species find acceptable conditions for development.

To the land of the S2, with the site formula: XII1Y3a was chosen formula 30%Black pine 50% Ash 20% Spruce, and the establishment of schemes and formulas blend. The ecological requirements of species and stand type were chosen for the Anina perimeter following wood species: white pine, aspen, spruce, larch, ash, and shrubs of the species chosen to bat.
### Afforestation compositions, number of seedlings, spacing of plans

**Table 1**

<table>
<thead>
<tr>
<th>No</th>
<th>Site type</th>
<th><strong>Afforestation composition</strong></th>
<th><strong>Area</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Number of seedlings/ha, Spacing of plants</strong></td>
<td><strong>Ha</strong></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>S₁</td>
<td>30% Aspen 50% Ash 20% Spruce</td>
<td>10,70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3350 seedlings/ha. Spacing of plants: 2x3 m; 1x2 m</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>S₂</td>
<td>30% Black pine 50% Birch 20% Bat,</td>
<td>44,50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6700 seedlings/ha. Spacing of plants: 1 x1,5 m</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>S₃</td>
<td>20% Black pine 50% Bat 30% Birch</td>
<td>5,65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4000 seedlings/ha. Spacing of plants: 1 x2,5 m</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>S₄</td>
<td>30% Black pine 70% Birch</td>
<td>2,65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3300 seedlings/ha. Spacing of plants: 1 x3 m</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>S₅</td>
<td>30% Spruce 40% Larch 30% Ash.</td>
<td>0,70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5000 seedlings/ha. Spacing of plants: 1 x2 m</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>64,2</td>
</tr>
</tbody>
</table>

### Conclusions

1. Mounding of existing land, led to breaking the natural balance, and getting some infertile mountains, poors, who do not provide favorable conditions for development of forest species.
2. To improve the degraded land in the Steierdorf perimeter, we used resistant species, which resist in extreme resort, as: black pine, birch, ash, bat.
3. After installation of the forest vegetation, this land will get another look, look like a lovely landscape, which also will provide space for living many populations of birds and wild animals.

### References