The Pedological Cover from Production Unit IV Geoagiu and Its Influence upon the Productivity of the Forest Station

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Abstract. Of geographical point Production Unit IV Geoagiu is situated in the Trascau Mountains, on the eastern slope of their.

The forest from P. U. Geoagiu have a surface of 2059 ha, belonging to 27 types of forest, represented by 23 types of station, grouped on the 3 fitoclimatical levels. The pedological cover is represented by luvisols (47%) with humus type mull-moder, frequently being met oak (Quercus petrea), and the mixtures thereof, the have medium fertility for oak (Quercus petrea) forest, eutricambosol (22%) with a medium to high fertility for beech (Fagus sylvatica) forest found this soil, preluvisol (16%) with an acid reaction, humus moderate, litosol rendzinic (9%) and rendzine (6%), with a lover fertility for forest vegetation due to small edaphic volume.

Analyzing the productivity of the main forest type we can conclude that: in the Mountain Pre Mountain Level of beech (FM₁ + FD₄) which represents 24% of the surface, The Hills of oak, beech and oak-beech (FD₃) which represents 68% of the surface, the hills of rolling and sleauri of hill (8%).

INTRODUCTION

From the geographical point Production Unit IV Geoagiu is situated in the Trascau Mountains, on the eastern slope of their Manastiri Rivers, downstream the Trascau Keys (the Peak Tarcaului, 1217m).

Geological, the Production Unit IV Geoagiu is places on a crystalline fundament which belongs to three tectonic magmatic cycles. Production Unit consists of deposits of Holocene Quaternary (alluvial gravels and sands), formations of the Neogene, Miocene-Biocen series (conglomerates, sandstones, marl), conglomerates, sandstones, marl, clay and shale of upper Cretaceous.

Climatically the area corresponds to the Continental Climate with medium annual temperatures, which oscillate between 9°C in the hill area and 6°C in the mountain area and medium precipitations between 570-900mm.

MATERIALS AND METHODS

The soil probes aken from the representative stations from each fitoclimatical level, the analyze was made only for the typical subtypes of each soil.

The analyze was made after the method ICPA from OSPA Alba Iulia, for the productivity analyze for the main forest types as data base were used the arrangement made by ICAS Bucharest for these production units, the humus was determined after the Walkley Black method, the total nitrogen was determined Kjeldahl method by desegregation with H₂SO₄, at 35°C, catalyst potassium sulfate and copper sulfate, the mobile potassium was determined after the Egner-Riehm Domingo method through extraction and dosage through
photometrical flame and the potentiometrical pH was determined with a glass electrode and of calomel in salted watery suspension, the rapport soil/water being of 1/5.

**RESULTS AND DISCUSSION**

The forest vegetation for the Production Unit IV Geoagiu is arranged on vertical, from the fitoclimatical view on the next levels: *The Montain Pre Montain Level of beech* (FM₁+FD₄) having an area of spread between 800-1 150 m, representing 24% of the surface, *The Hills of oak, beech and oak-beech* (FD₃) between 500-800 m, representing 68% of the surface and *The hills of mixtures* between 500-200 m representing only 8% of the total area.

From the pedological point of view, the soil cover is the result of the action of the environmental factors under the influence of the parental material an the existing vegetation, determining an altitude delimitation of soil.

Concluding we can say that in the lower part of the mountain climatic level (*the montain pre montain level of beech*) the main process is that of decarbonatation, debazification and clay based processe forming low acid, acid and moder mull, with the making of humico-clay-ferics complexes, with a low to high migration of the clay and the ferric hydroxide and low processes of stagnoclaysatation, in this situation the predominant soil is the eutricambosol.

In the hilly upper floor the pedogenetic processes are similar with those mentioned above, but they have a smaller intensity, dominated by processes of accumulation of mull humus type and moderately less raw humus. In this area the predominant soils are the preluvosols and rendzina.

In the lower hilly the pedogenetic processes have a smaller intensity. In this area main soils are luvosol and rendzinic soils.

These soils, with an edaphically low level, structurally not differenced, the reaction is high acid on the whole soil profile, with a high level of brute humus on the depth from 0 to 10 centimeters, a low degree of saturation in basic (V%), a low density on the depth 0-15 cm, high porosity, medium contents of total nitrogen, and low content of potassium.

The Physicochemical Proprieties of the Soils from U.P. IV Geoagiu are found in Tab.1.

<table>
<thead>
<tr>
<th>Soil</th>
<th>Area (ha)</th>
<th>Profile</th>
<th>Sandstones</th>
<th>Dust</th>
<th>Clay</th>
<th>pH</th>
<th>Hum (%)</th>
<th>N tot</th>
<th>K (ppm)</th>
<th>CaCO₃</th>
<th>V (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luvosol</td>
<td>955.6</td>
<td>Ao 56.0</td>
<td>22.40</td>
<td>16.00</td>
<td>4.9</td>
<td>3.2</td>
<td>0.190</td>
<td>5</td>
<td>-</td>
<td>17.60</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>El 60.10</td>
<td>19.30</td>
<td>8.60</td>
<td>4.6</td>
<td>0.4</td>
<td>0.060</td>
<td>3</td>
<td>-</td>
<td>10.40</td>
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<tr>
<td></td>
<td></td>
<td>Bt 11.3</td>
<td>10.60</td>
<td>56.2</td>
<td>5.4</td>
<td>-</td>
<td>0.070</td>
<td>4</td>
<td>-</td>
<td>14.60</td>
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<tr>
<td></td>
<td></td>
<td>C 53.7</td>
<td>7.40</td>
<td>18.90</td>
<td>5.2</td>
<td>-</td>
<td>0.110</td>
<td>5</td>
<td>-</td>
<td>17.90</td>
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<tr>
<td>Eutricambosol</td>
<td>451.8</td>
<td>Ao 24.10</td>
<td>35.60</td>
<td>41.80</td>
<td>4.6</td>
<td>2.9</td>
<td>0.146</td>
<td>107</td>
<td>1.2</td>
<td>62.80</td>
<td>78.30</td>
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<tr>
<td></td>
<td></td>
<td>Bv 20.20</td>
<td>23.40</td>
<td>57.30</td>
<td>4.8</td>
<td>1.2</td>
<td>0.070</td>
<td>-</td>
<td>-</td>
<td>2.1</td>
<td>84.10</td>
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<tr>
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<td></td>
<td>C 16.20</td>
<td>18.40</td>
<td>37.70</td>
<td>5.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2.6</td>
<td></td>
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<tr>
<td>Rendzina</td>
<td>315.3</td>
<td>Am 20.60</td>
<td>10.50</td>
<td>57.80</td>
<td>6.9</td>
<td>6.8</td>
<td>0.312</td>
<td>164</td>
<td>31.0</td>
<td>93</td>
<td>97</td>
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<tr>
<td></td>
<td></td>
<td>A/R 26.80</td>
<td>17.60</td>
<td>48.60</td>
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<td>0.178</td>
<td>79</td>
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<td>-</td>
<td>7.2</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Preluvosol</td>
<td>336.9</td>
<td>Ao 58.10</td>
<td>14.90</td>
<td>23.70</td>
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<td>C 70.6</td>
<td>21.30</td>
<td>8.20</td>
<td>5.4</td>
<td>-</td>
<td>-</td>
<td>6.8</td>
<td>7.4</td>
<td>93.1</td>
<td></td>
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</table>
Analyzing the data from table one we can remark the fact that 22% of the soil is eutric cambosoil which are more frequent in the Fagus level, and the mixtures level, they have a middle fertility, meaning a good humus level (2.9%), a strongly acid pH, good level of nitrogen, resulting in medium productions in the fagus forest, sometimes high.

Preluvisoils represents 16% from the whole surface, more frequent in the oak (Quercus petrea) level, with a very good quantity of humus, they have a medium fertility, especially for oak and beech forest.

Luvosoils representing 47% from the surface, more frequent in the oak level, having a highly acid reaction, assuring an average productivity for beech and oak forest.

Rendzine soil representing 15% from the surface, with a very good quantity of humus, they have a medium productivity, especially for oak and beech forest.

The main forestry stations from The Montain Pre Montain Level of beech (FM₁+FD₄) are (Fig. 1.): a) Montain-premontain of beech, Pi, calcareous rocks and erosion; b) Montain-premontain of beech, Pi, rendzinic, small edaphic; c) Montain-premontain of beech, Pm, rendzinic, middle edaphic; d) Montain-premontain of beech pm, small brown edaphic, with Asperula-Dentaria; e) Montain-premontain of beech, Pm, middle brown edaphic, with Asperula-Dentaria; f) Montain-premontain of beech, Ps, high brown edaphic, with Asperula-Dentaria.

Analyzing the forest types from the beech level we can remark the following aspect: the largest surface is occupied by Montain-premontain of beech with Asperula-Dentaria of medium productivity followed of Montain-premontain of beech, Pi, calcareous rocks and erosion.

In The Hills of oak, beech and oak-beech (FD₃) we find the following types of station: c) Oak hills Pm, strongly podzolic in the middle and lower edaphic, of grass; f) Oak hills, Pm weak medium podzolic brown, edaphic in middle; n) Beech hills, Pm, brown high edaphic, with Asperula-Asarum; b) Oak hills, Pi, strongly podzolic, in the middle and lower edaphic, with Luzula luzuloides etc.
In Fig. 2 is presented the distribution of the hills of oak, beech, oak-beech. We can remark the fact that the most representative are the oak hills on podzolit soil of low productivity and the breech hills lower productivity have the lowest spread.

The hills of mixtures is represented by the following forestry stations: Hill of mixtures, Pm, podzolit, with grass and Hill of mixtures, Pm, podzolit.

Analyzing the main forest types from this level we can remark the fact that the surface analyzed is covered by podzolic soils of medium productivity for by oak and mixtures forest.

CONCLUSIONS

The forest from P.U. IV Geoagiu have a total surface of 2059 ha, belonging to 27 types of forest, represented by 23 types of station, grouped on the 3 fitoclimatical levels.

The pedological cover is represented by luvisol (47%) with humus type mull-moder, frequently being met oak (*Quercus petrea*), and the mixtures thereof, have medium fertility for oak (*Quercus petrea*) forest, eutricambosol (22%), relatively rich in humus, with a medium to high fertility for beech (*Fagus sylvaticus*) forest found this soil, preluvosol (16%)
with an acid reaction, humus moderate, medium productivity of beech and oak, and rendzine (15%), with a lower fertility for forest vegetation due to small edaphic volume.

Analyzing the productivity of the main forest type we can conclude that: in The Montain Pre Montain Level of beech (FM_{1}+FD_{4}) which represents 24% of the surface, 8 % of the forests have a superior productivity, 47% average and 45% low.

The Hills of oak, beech and oak-beech (FD_{3}) which represents 68% of the surface, 725 of the forest have an average productivity, 25% low productivity and only 3% high productivity.

The hills of mixtures (8%) of the surface, the forest have average productivity.

REFERENCES

4. *** Amenajamentul Silvic of U. P. IV Geoagiu.