MONITORING OF THE SOIL FERTILITY IN LUGOJ HILLS

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Abstract. *In terms of geomorphology, the investigated area belongs to the large physical-geographical unit "Banato-Crisana" taking place in the interim relief stage between Western Carpathians and Pannonian Depression edge. Within that sector in which the investigated area meet the following forms of relief: hill, terrace, plain ramble, meadow. Geologically investigated area is part of the Pannonian Depression, its eastern end, which was formed by the gradual silting of the lake in "Pleistocene-Quaternary". Appropriate geological formations mentioned in the soils identified and delineated in the investigated area have generally found the following main groups of parent materials: loam, clays and fluvial deposits. Lugoj hills cover an area of 10.676.33 hectares. The main soil types in the investigated area are stagni-gleyic phaeozems an area of 4.97 ha (0.05%), haplic luvisols on 713.34 ha (6.68%) to 5822.63 ha, typic hapludalfs on 6286.05 ha(55.84%) , haplic planosols on 488.25 ha (4.57%), typic eutrocryepts on 1326.68 ha (12.43%), haplic stagnosols on 301.77 ha (2.83%), haplic gleysols on 426.07 ha (3.99 %), pellic vertisols on 364.47 ha (3.41%) and haplic fluvisols on 625.87 ha (5.86%). This paper is a study of soil fertility improvement methods in Plain River. The different types and groups of genetic soil types existing today in the perimeter are the result of the actions sought in time and space complex pedogenetic factors (underlying rock, landscape, climate, vegetation, hydrography, hydrology, fauna) plus the influences caused by human actions from draining and drainage works to intensive agriculture today. Soils formed in these conditions are a relatively recent stage of soil formation as a result of having little time out of the water. The process of soil formation is relatively recent and their direction of development is dictated largely by the microrelief forms they occupy and thus the groundwater level in the profile, and the nature of parental rocks.*

Keywords: *limiting factors, soil fertility, haplic luvisols, haplic stagnosols, haplic fluvisols.*

INTRODUCTION

Soil, natural formation on the surface of the lithosphere is constantly evolving through the transformation of rocks and organic matter under the joint action of physical factors, chemical and biological. The place of the flux of organic matter having a complex biochemical composition, in a porous body which retains water and air, the soil gets a new property to the rock which is formed, namely "fertility".

Soil fertility was formed over time by accumulating progressive rock weathered and altered the necessary elements of plant life. Soil fertility is acquiring to provide conditions for plant growth and development by accumulating vegetation factors (light, water, air, heat, nutrients and biological activity) and create the conditions for these factors to be used in sufficient quantities.

Fertility and fertility of the land is an essential trait soil it radically different from the rock, which has developed dynamically over time, under the impact of human activity. Fertility is a very complex content and is a function (result) of all its qualities.

Fertility is the result of all soil properties (physical, mechanical, physical, mechanical, hydro, chemical, biological and ecological) in interaction with all stakeholders vegetation and cultivated plants is studied by other disciplines (soil science, agrochemical etc.). In terms of the environment it is important to address the unitary economy, systemic soil fertility to its conservative modeling, with emphasis on crop requirements and environmental protection. Unitary approach the correlation between soil fertility, plant requirements and agro-technical measures requires knowledge of the following:

- Categories and indicators of soil fertility,
- Assessing the pitch determination in a laboratory and fertility of the soil parameterization of indicators in relation to the requirements of the crop,
- Monitoring and modeling soil fertility.

MATERIALS AND METHODS

The research was carried out in the field in the laboratory, in order to identify and to establish the soil's properties. Collected soil samples were analysed according to the national and international methods. pH was determined by potentiometric method, in water extract 1:2.5 ratio, using a Mettler Toledo pH-meter. Humus content was established by Turin method, improved by Gogoasa. Soil potassium content was determined in ammonium-acetate lactate solution, soil extract being measured by a Varian atomic absorption spectrophotometer at 766 nm wave length. For phosphorus content it was used Egner-Rhiem-Domingo method, the samples being analyzed by a Cintra spectra-photo colorimeter at 660 nm wave length. The content in soil total nitrogen was established by Kjeldahl method. The soil types of the research area were verified according to the Romanian Soil System Taxonomy and after the Soil Atlas of Europe. The obtained values of soil analyses were interpreted after the Pedological Studies Methodology.

RESULTS AND DISCUSSIONS

Total nitrogen content is medium on 76,34% of the surface, reduced on 21,39% of the surface and very reduced on 2,27% of the surface (fig. 1).

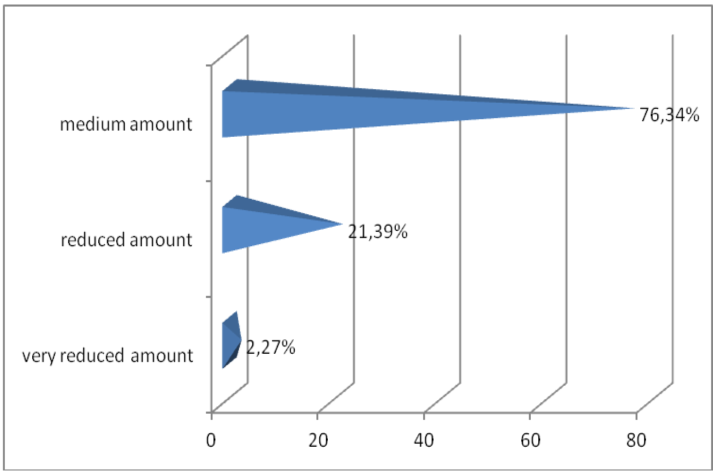

Fig. 1 Distribution of total nitrogen content classes

Content of Kalium is very reduced on 5,76 of the surface, reduced on 10,58% of the surface, medium on 63,87% of the surface, high on 14,24% of the surface and very high on 5,76% of the surface (fig. 2).

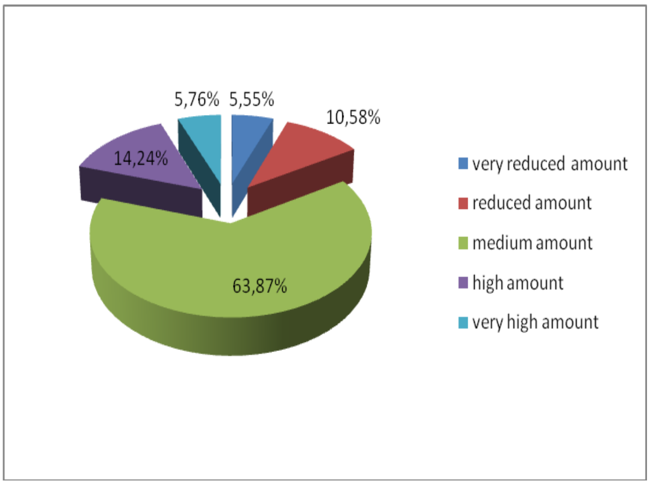

Fig.2 Distribution of K_2O content classes

Phosphorus content is very reduced on 0,32% of the surface, reduced on 6,07% of the surface, medium on 68,93% of the surface, high on 21,71% of the surface and very reduced on 2,97% of the surface (fig. 3).

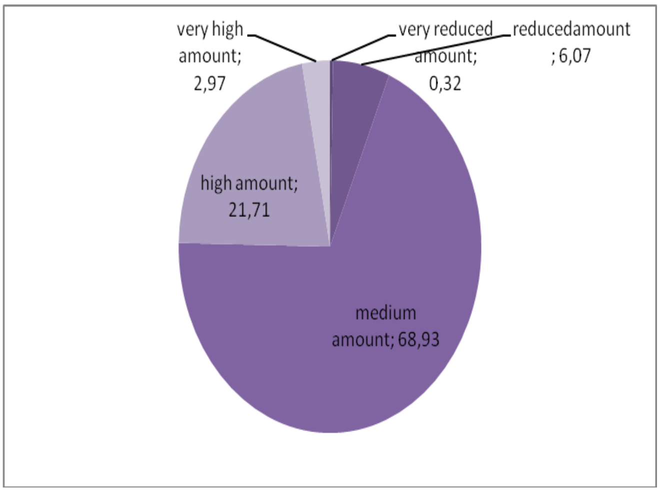

Fig.3 Distribution of soil P_2O_5 content classes

Soil reaction is moderate acid on 45,14% of the surface, weak acid on 13,07% of the surface, neutral on 18,77% of the surface and weak alkalin on 23,02% of the surface (fig. 4).

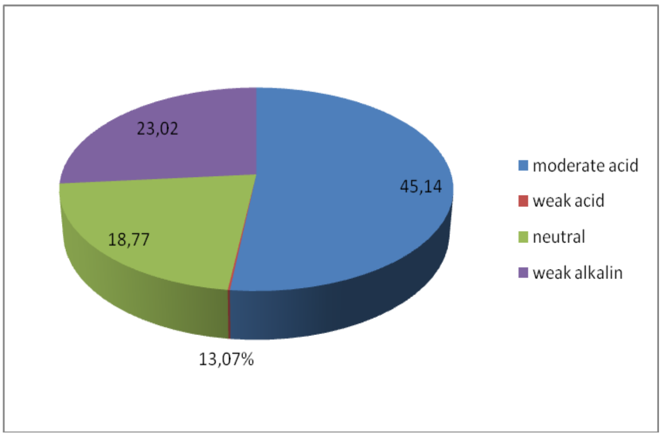

Fig. 4 Distribution of soil reaction classes

Soil humus content is reduced on 27,72% of the surface, medium on 60,6% of the surface and high on 11,68% of the surface (fig. 5).

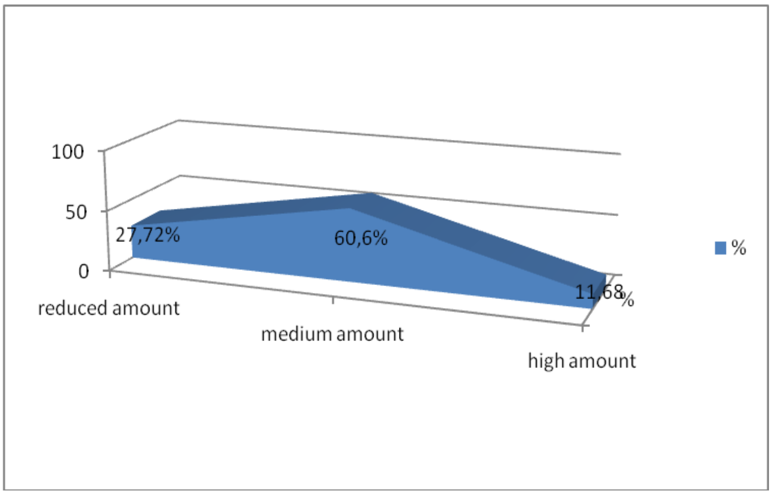

Fig. 5 Distribution of soil humus content classes

CONCLUSIONS

The most propertie of this soils is soil reaction who limiting the fetility of the majority of soil types being moderate acid on 45,14% of the surface with pH values between 5,01-5,8. This soil types need to be liming with calcium carbonate.

In the same time soil humus content is affecting soil fertility being reduced and medium on 68,32% of the surface. On this soil types is necesarly to administrate manure.

Content of the principals macroelement (N, P, K) of this soil types affect their fertility being very reduced and reduced on 23,66% of the surface in nitrogen case, on 16,34% of the surface in kalium case and 6,39% of the surface on phosphorus case.

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