Condition of soil in Szombathely

András Bidló, Péter Szűcs, Orsolya Kámán, Adrienn Horváth, and Eszter Németh
Department of Forest Site Diagnosis and Classification, University of West-Hungary, Sopron
abidlo@emk.nyme.hu

On further investigation we studied the interaction between the town and its environment, the characteristics of continuous material, energy and information flow. Our main aim is to determine the chemical and physical parameters of urban soil based on interactive connection, moreover to investigate the interaction between the town and its environment. Firstly, we appointed the sampling points in spring-summer period of 2011. We collected altogether 176 samples on 88 points from two depth levels of soil (0-10 and 10-20 cm), then we measured the most important chemical and physical characteristics of soils under laboratory circumstances.

On the basis of watery pH- measurement the upper part of soil (0-10 cm) almost the half of samples (46%) is neutrality, 25% fall under slightly alkaline class, another 24% is classed among slightly acidic category. Acid and strongly acid pH-category was found only small number (3-3%) (Figure 1.). The pH values of samples of lower layer (10-20 cm) of soil didn't not show large difference compared to value of upper part. In this layer are predominate the soil samples, which have neutral pH (37%), as well as there are slightly alkaline (34%) and slightly acid (25%) category amongst pH-values.

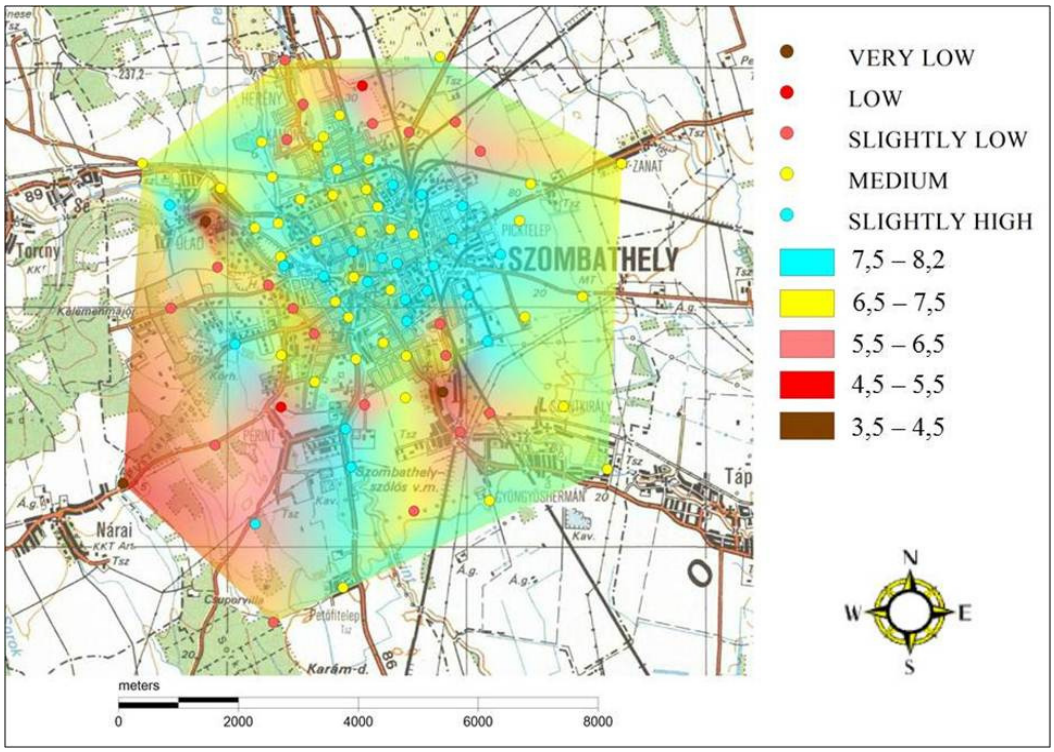

Figure 1. The soil pH values (pH_{H_2O}) in upper part (0-10 cm)

On the strength of the particle size distribution and the Arany-type compactness analysis the greater part of samples are clayey loam physical assortment, which in the upper and lower layer 41-41% of soil samples. In addition physical assortment of samples in the upper part are follow: clay 34%, loam 16%, heavy clay 8% and sandy loam 1%. In the lower layer the distribution of physical assortment are follow: loam 29%, clay and sandy loam 10-10%, heavy clay 9% and sand 1%. The half of the examined specimens didn't contain any carbonic chalk. The percentile value of carbonic chalk in upper part is 42%, in the lower part is 43%. We measured in the 54% of upper layer and in the 54% of lower part above 3% lime content. In case of some samples we detected between 1-3% lime content. Going outward from downtown of town we detected continually less carbonic chalk content in soil samples. In more than half of collected samples was the humus content significant, in both layers. In 0-10 cm depth 59 samples belong to in strongly humic category, 21 samples in humic class and 7

samples in the slightly humic category. In the 10-20 cm depth 32 samples fall within in strongly humic category, 48 samples in humic class and 7 samples in the slightly humic category. We discovered above 10% humus content boggy soils only one place in the town. Small humic content upper soils are situated NW and SE region of the town. On the basis of total nitrogen content investigation the upper soil layer well supplied with nitrogen in 69%, medium supplied in 30%. In lower layer the values of nitrogen are similar to upper part. We measured high nitrogen content in Bogát and Herény. In the course of ammonium-lactat-acetous acid (AL) solvent potassium content measurement we detected moderate and moderately medium data in upper part, and very low and low values characterized the lower layer. On the strength of AL-solvent phosphorus content investigation we found above 19mg/100g soil values in 61 samples of upper layer and in 47 samples of lower part. The higher values occur by busy roads and in outskirts. According to the calcium content examination the 92% of values are classed in below 2,6 g/kg category. Extreme values are rare, the dispersion is precise. In case of magnesium values from examined samples 80 unit fall in to under 0,4g/kg. The ethylene-diamin-tetra-acetous (EDTA) and diethylene-triamin-penta-acetous (DTPA) measurements of metallic element show more interesting data concerning copper and zinc content. Zinc values between 3,5 és 10 mg/kg completely cover the territory of inner city. In the outskirts clearly described by under 3 mg/kg values. Summed up it can be ascertained, that the half of zinc content in both layers measures above 3,5 mg/kg soil data (Figure 2.).

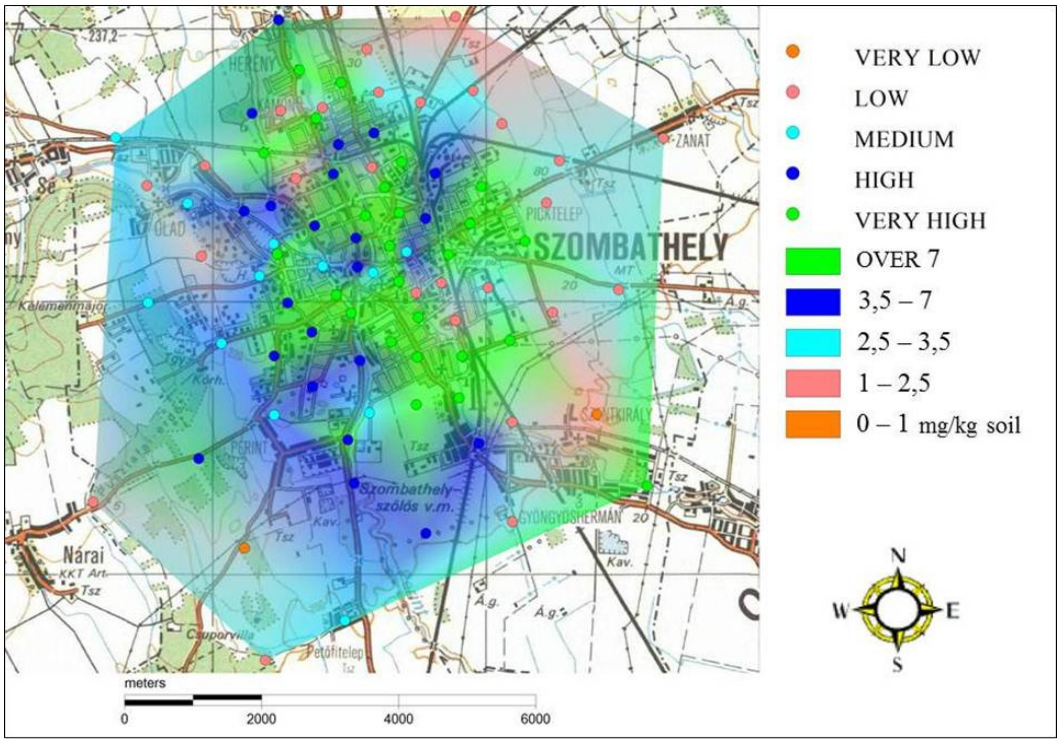

Figure 2. The zinc content in the lower layer (10-20 cm)

In case of EDTA/DTPA copper content the 67% of samples is beyond 3 mg/kg value in the 0-10 cm depth part, while this is scale 61% in the 10-20 depth layer. The data obtained in the course of iron and manganese examination show similar dispersion. The almost 50% of values of iron categorized in 0-100 mg/kg soil class, in both soil layer. The values of manganese get in 63% in upper category. The salient iron values was found at the measuring points by the side of Gyöngyös-stream. We detected salient manganese content in soil samples, which we collected from beside of monuments.

This work was funded by the TÁMOP-4.2.2.B-10/1-2010-0018 and TÁMOP 4.2.1.B-09/1/KONV-2010-0006. We thank Zsófia Varga, Mrs. Miklósné Stark and György Pulger for their assistance in carrying out the laboratory examinations.