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Urban soil heavy metal contamination and data processing

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The ecological role of soil in urban ecosystems is very important. The state of the urban environment together with its composition, possible sources of contamination and degradation have to be evaluated. The analytical soil data need specific end-user oriented interpretation to be understood and, consequently, applied in planning and soil quality management procedures. Increasing the representatives and the applicability of data require consideration of the spatial component of data. Characterisation of soil properties of urban areas is a complex problem, especially when pollution is considered. The spatial distribution of the contamination is typically poorly related to soil properties. In addition, the accessibility to the sampling sites is often restricted. When designing a sampling scheme a surveyor has to carefully balance scientific integrity, legal validity and practical attainability.

The aim of this work is to illustrate the soil survey carried out in Grugliasco (Italy) with special focus on the use of extraction procedures describing the availability of the heavy metals to the plants and to the humans. A stratified judgemental sampling pattern was chosen in order to cover the territory of the municipality. Soil of sampling sites described using the new sampling form adapted to urban environments and analysed for the general chemical and physical characterisation. The heavy metals fraction extracted were pseudototal content (*aqua regia*), plant bioavailability (DTPA + TEA, pH 7.3), human bioaccessibility (Glycine, pH 1.5) and easily mobilisable (Acetic acid, 0.11M/l).

A GIS system with a multi-purposes database was developed as a semi-automatic tool for i) human health risk assessment and ii) urban soil quality evaluation for planning and soil management practices.