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The geochemical atlas of Italian soils

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The geochemical Atlas of Italian agricultural and grazing land soils was carried out as part of GEMAS project whose objective was to characterize soils of rural areas of the whole Europe. Soil samples were collected at an average sampling density of 1 site per 2500 km2. Two different sample types were collected: (1) 121 agricultural soils (Ap) on regularly ploughed land to a depth of 20 cm and (2) 121 grazing land soils (Gr) (land under permanent grass cover) to a depth of 10 cm. All soil samples were air dried, sieved to <2 mm, homogenised and finally split into 10 sub-samples. Both sample types (Ap and Gr) were analysed at the BGR for a suite of 41 elements by WD-XRFS. The same samples were also analysed after AR and MMI extractions by a combination of ICP-AES and ICP-MS for 53 elements. In addition, other parameters were determined: pH, TOC, total carbon and total sulphur, LOI, CEC, Sr-isotopes, Pb-isotopes, MIR-spectra.
By means of a GIS software, georeferenced data of the Italian territory were used to produce the geochemical maps of all the analysed elements for both agricultural and grazing land soils. Specifically, for each element and sampling media a map reporting interpolated data and graduated dots was produced; univariate statistics and graphs were also associated to each map. The Atlas also contain: 5 maps for regional variability of factor scores of elemental associations resulting from R-mode factor analysis and 15 baseline and land use maps for some selected elements (As, Be, Cd, Co, Cr, Cu, Hg, Ni, Pb, Sb, Se, Sn, Tl, V, Zn) following the Italian intervention criteria.