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Material and methods

Introduction

Urban, agricultural, industrial and undisturbed natural areas have been sampled in Murcia (southeast Spain), covering a surface of 100 km² (Figure 1). Most of the agricultural areas are lemon tree plantations, while industrial areas show a great heterogeneity of industries.

Chemical analysis

- Soil organic matter (Anne 1945; Duchaufour 1970).
- Soil pH 1:1 soil/water or 1M KCl suspension (Peech, 1965).
- Soil electrical conductivity, 1:5 soil/water suspension (Andrades, 1996).
- Equivalent calcium carbonate, volumetric method of Bernard’s calcimeter.
- Total nitrogen (Duchaufour, 1970).
- Cation exchange capacity (Chapman, 1965).

Results and discussion

Chemical properties are affected by various factors, among them parent material, landscape position, climate, vegetation and land use practices. The effect of these factors is sometimes positive: improving the content of matter organic, increase the nutrients retention capacity, etc. while in other occasions the properties of the soils are negatively affected: loss of organic matter, salinization, contamination, etc. An inadequate soil management often can be irreversible for future soil uses. The study of the differences and variations in the soil properties is an indicator that determines if a soil use is being appropriated or land degradation is taking place.

The objective of this study is to identify the effect of different uses on the soil chemical properties. Organic matter, pH-water, pH-KCl, salinity, cation exchange capacity, and calcium carbonate have been analyzed as indicators of land degradation.

Objective

Most of the samples, pH-water values range from 7.5 to 8.5 being fairly basic or basic. Only, the average of the industrial area 2 is up at 8. Nevertheless, significant differences don’t exist among the different soil uses.

CaCO₃ values range from 3 to 83%, the highest values appear in the urban use, and the lowest in the undisturbed use. In a general view, the urban, industrial 1, areas without use and agricultural use have higher percentage of calcium carbonate that undisturbed use and industrial 2.

C.E.C. is affected by land use. In agricultural, industrial 1, undisturbed and urban uses range from 10 to 12 cmol/kg, being a normal C.E.C. On the other hand, the areas without use has a C.E.C. from 8 to 10 cmol/kg, and, in last place, C.E.C. of the industrial 2 use is about 7 cmol/kg. The highest C.E.C. access, in general, in uses with high levels of organic carbon.

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References

Anne, (1945): Agra , 2, 161-172