

Spatial variability of phosphorus and its relationship with some of the chemical properties of soils in Argentina Republic

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Considering that soils are heterogenous and their variability depends, among other factors, on original material, topography, climate and human activity, it very important to know their nutrient concentrations and the specific requirements for the different crops, in order to carry out a rational fertilization program. The aim of this work is to evaluate the spatial variability of available phosphorus (P) and its relationship with some properties of the soils under no tillage system in different areas. Studies were made in soils in Paraná, Entre Rios (Vertic Argiudoll, slope 3%), in San Andres de Giles, Buenos Aires, (Vertic Argiudoll, slope 0,5%), and in General Villegas, Buenos Aires (Typic Hapludoll, slope 0,05%). A plot of a hectare was sampled with a 25 cell grid, collecting compound samples in two depths, before soybean sowing. Chemical determination was made using the standard routine methods of the laboratory of the Institute of Soils. The availability of the nutrient from 0-20 cm depth was estimated on a weighted average of 0-5 and 5-20 cm. Result interpretation was based on the critical value rank cited by INTA. Descriptive statistics and geostatistics techniques were used to analyze data and to generate P distribution and availability maps though interpolation. In Paraná the media obtained for extractable P was 17,21 mg kg⁻¹ with a coefficient of variation (CV) of 40,85%. In San Andrés de Giles the media obtained for extractable P was 4,24 mg kg⁻¹ and the CV 33,61%, both considered extremely high. In General Villegas the media for extractable P was 10,86 mg kg⁻¹ with a CV of 26,14%, considered high. Considering land topography, extractable P variability increased when the slope increase. The concentration media for extractable P were in decreasing order for: Paraná, General Villegas and San Andrés de Giles. In Paraná extractable P was very significantly correlated with pH and significantly correlates with manganese (Mn), In San Andres de Giles very significantly with magnesium (Mg) and significantly with Mn and in General Villegas extractable P very significantly with organic matter (OM) and total nitrogen (Nt).

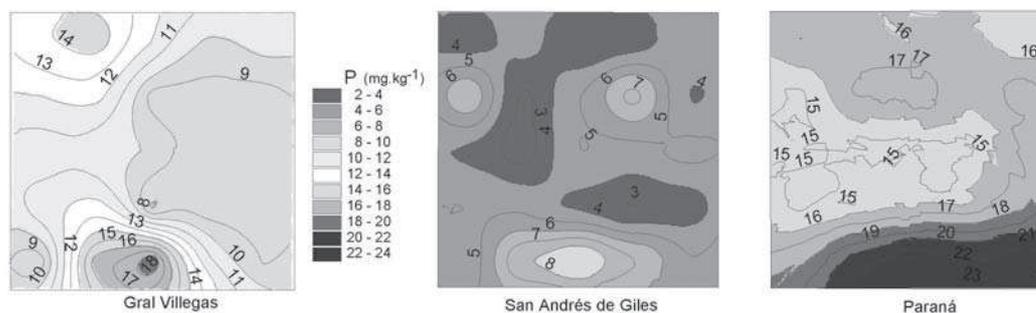


Figure 1. Phosphorus distribution map in the three sites.

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