



Soil nitrogen variability. Noise or information?

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Soils can be seen as the result of spatial variation operating over several scales. This observation points to “variability” as a key soil attribute that should be studied [1]. Soil variability has often been considered to be composed of “functional” (explained) variations plus random fluctuations or noise. However, the distinction between these two components is scale dependent because increasing the scale of observation almost always reveals structure in the noise [2].

Geostatistical methods and, more recently, fractal/multifractal and wavelet techniques have been used to characterize scaling and heterogeneity of soil properties. The objectives of this study were to analyze Nitrogen variability in a soil transect through the variability of a wheat crop measured through plant weight, grain weight and N uptake. Multifractal and wavelet techniques based on previous studies [3] were used in this case.

The site of this work is located near on Mancha Occidental aquifer (U.H.04.04, 6.953 km²) and Campo de Montiel aquifer (U.H. 04.06, 3.192 km²) with high contamination problems and soils with a restrictive subsurface “caliche” pan layer (petrocalcic horizon). The average soil depth of the plot undergoing the experiment was 0.60 m, the texture is a sandy-loam soil, slightly basic (pH 7.9), poor in organic matter (0.20%), rich in potassium (407 ppm, ammonium acetate) and with a medium level of phosphorous (19.4 ppm, Olsen). Earlier than the beginning of the wheat crop, the plots were

used for melon crop experiments to optimize fertirrigation. The agronomic practices created a higher variability in soil Nitrogen content and a record of the spatial location of the plots, fertirrigation lines and the treatments applied were kept. No fertilizer or organic amendments were use for the cereal crop.

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