عنوان مقاله:

FRACTAL SCALING OF THE HYDRAULIC AND HYDROLOGIC PROPERTIES OF AN ACRISOL

محل انتشار:

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خلاصه مقاله:

Soils properties show spatial and temporal variability at different scales. The representation of processes and properties at a scale different from the one at which observations and measurements are made is a universal problem in soil science, since these measurements are dependent on the scale of observation. Fractal models assume that this dependence is the same across the range of scale. Due to the self-similar properties of fractalsand their representation by the fractal dimension (D), they have prospective as a descriptive tool for scaling up various soil parameters. The objectivesof the study were to establish the fractal interpretation of spatial variability of saturated hydraulic conductivity (Ks) and infiltration parameters, and todescribe their isotropic nature and potential effect on fractal dimension. Fractal dimensions of collected data were obtained from a log–log scaleplot of the variogram. Ks recorded the highest D of 1.936, whereas, that for infiltration rate recorded the lowest of 1.814. Results indicated that soilproperties show fractal behaviour which can be used as a tool to assess isotropic variability of soil parameters on a field scale.

کلمات کلیدی:

Fractal model, Soil Hydraulic Properties, Scaling, Spatial Variability, Fractal Dimension