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Study of spatial variation in soil porosity in sections of microtomography images

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Computed X-ray microtomography (μ - CT) has proved quite useful for quantitative soil analysis technique because it provides microstructural parameters in soil porosity, providing sampling a series of two-dimensional images with micrometer spatial resolution, thus enabling study the spatial variation of porosity between images depending on the texture and soil management. Soil samples from Red Nitosol class (56% clay and 13% sand) under the managements of forest and cultivation of annual crops were collected, and from the class Typic Quartzipisamment (7% clay and 91% sand) under the forest managements and pasture, being three samples collected for each type of management. The images were obtained with microtomógrafo Skyscan model 1172. However 2400 two-dimensional images were analyzed by management with spatial resolution of 12μm.pixel- 1. The image analysis counts only macro and mesopores. For image analysis under Red Nitosol with forest management were observed average porosity of 25.83% with a standard deviation of 3.08 % between the images and on management of annual crops the porosity was 11.68 % with a shift 0.87% standard. For the area under Typic Quartzipisamment with forest management the value of average porosity was 28.58% with the standard deviation 1.93% and the pasture porosity was 23.01% with a standard deviation of 0.58%. The results show that the variation of porosity in the sections of images was higher in the clayey soil and the forest management has greater variation of porosity in two textures studied, so to microtomographic analyzes, is necessary to collect a large number of samples to better represent these soil class texture and use.