

Long term effects of sewage sludge on chemical properties of a degraded soil profile

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Degraded areas are characterized by the removal of their original vegetation and topsoil, leading to loss of organic matter (OM), alteration in soil physical properties and low availability of nutrients. The use of sewage sludge is an alternative for the recovery of these areas due to its content of OM, which acts as a soil conditioner, in addition to the high levels of macro and micronutrients and beneficial soil biology. The objective of this study was to verify the long term effect of the application of increasing doses of sewage sludge on the chemical properties of a degraded soil up to one meter deep, ten years after the application of the treatments. The experiment was installed at Fazenda Entre-Rios, Itatinga-SP, São Paulo, Brazil, in an area with a high level of degradation and compaction. Subsequently, the area was divided into 32 plots, with 8 treatments and 4 replicates, and planted with native species of the Atlantic Forest. The treatments were: different doses of sewage sludge (2.5; 5; 10; 15 and 20 t ha⁻¹, with K supplementation); mineral fertilization (NPK+B+Zn); dose of K used as supplementation for the sludge and control treatment. After 10 years of application of the treatments, soil samples were collected every 20 cm depth (0-20, 20-40, 40-60, 60-80 and 80-100 cm) for chemical analysis. Levels of calcium (Ca) and magnesium (Mg) were not different in any depth. Significant differences occurred for sulfur (S) and some micronutrients, such as copper (Cu), iron (Fe) and zinc (Zn) at all depths evaluated. In addition, there were values with significant differences in only some layers: potassium (K) content, for example, in the 60-80 cm layer; phosphorus (P) content in the surface and the content of boron (B) and manganese (Mn) in greater depths