

Biological activity as an indicator of the effect of thermally dried and composted sewage sludges over the reclamation process of two residual soils from a limestone quarry

Biological effect of the addition of thermally dried and composted sewage sludges to residual soils from a limestone quarry

Effects on biological activity of thermally dried and composted sewage sludge addition to residual soils from a limestone quarry

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Abstract

The differences of the effects of three composted and three thermally dried sewage sludges on the biological fertility of two different residual soils (MNS and MLS, containing respectively 35% and 20% of fine earth) from a limestone quarry were evaluated under field conditions. Each sludge was mixed with each waste to reach an organic carbon content (C) of 1% (d. m) in the less than 2 mm fraction. Mixtures and control soils were sown and, after 13 months, sampling was performed after harvest. β -glucosidase activity, β -galactosidase activity, total (TCH) and extracted (ECH) carbohydrate content, microbial biomass (MB), extracted C (EC), basal respiration (BR) and cumulated CO_2 (CCO_2) were determined and their ratios with respect to C were calculated. Values of all the assayed absolute parameters were higher in the mixtures than in their relative residual soils. Sludge type had a significant effect in MB, β -glucosidase activity and ECH. TCH and EC were significantly higher in mixture samples containing MNS. CCO_2 and BR/C were generally higher in mixtures containing thermally dried sludges. EC/C was the index better detecting differences among sludge type effects on the soils.