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Network Coordinator: José Martinez, Cemagref, Rennes (France)

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University of Veterinary Medicine
Research Institute of Veterinary Medicine
Hlinkova 1/A
040 01 Košice
Slovak Republic

DYNAMICS OF THE DEVELOPMENT OF MICROORGANISMS IN SOILS FERTILISED WITH SEWAGE SLUDGE AND TOBACCO DUST

A. Sawicka, J. Czekala, A. Wolna

August Cieszkowski Agricultural University of Poznań,
Department of Agricultural Microbiology, ul. Wołyńska 35, 60 - 637 Poznań, Poland

Among the most important factors affecting man's coexistence with the surrounding nature is his coherent and consistent management of wastes, including sewage sludge and wastes generated by tobacco industry. Investigations indicate that, provided certain specified conditions are fulfilled, both of the above-mentioned kinds of wastes can be utilised as components to manufacture composts from materials poor in nitrogen.

The objective of this research project was to understand the developmental dynamics of some specified groups of microorganisms in soils fertilised with sewage sludge and tobacco dust and to ascertain the influence of this kind of fertilisation on growth and development of white mustard plants (*Sinapis alba* L.).

The experiment was established in pots filled with grey brown podzolic soil in a vegetation chamber. Prior to the filling of pots, soil was mixed with 2 g N per pot (6.5 kg fresh soil weight).

Two series of experiments were established. The first treatment comprised pots with: soil without any additives (control), soil mixed with sewage sludge, soil mixed with tobacco dust and soil mixed with both sewage sludge and tobacco dust. The second treatment included identical combinations as in treatment one but, additionally, sown with white mustard.

Soil from pots was collected in consecutive plant developmental phases (at the following five different terms: before sowing, stage of 5-6 leaves, beginning of flowering, initiation of silicles, full maturity) and soil samples were used to determine: total bacteria count, number of actinomycetes and fungi as well as the number of *Salmonella*, *Clostridium*, *Escherichia coli* and *Azotobacter*. Additionally, soil respiration activity was determined directly in pots. The number of microorganisms was determined by the plate method (CFU g⁻¹ DM of soil), while soil respiration activity was assessed on the basis of the released CO₂. In addition, the effect of additives on the development and yield of mustard was determined.

It was found that the addition to soil of sewage sludge and tobacco dust did not only stimulate the development of microorganisms (with the exception of pathogens) but also exerted a positive influence on mustard growth and yield. Plants were also found to act as stimulatory factors affecting bacteria propagation.