# The Effect of Selected Pesticides on Heterotrophic Soil Microorganisms

Stumberger, Gabriela

Soil microorganisms play an important role in soil fertility. Consequently, by acting on non-target organisms, pesticides can have a negative impact on soil quality. The aim of our research was to investigate the antimicrobial effect, the effect on growth and the effect on basal respiration of 3 pesticides on heterotrophic soil microorganisms. The pesticides used were a herbicide Boom Efekt (glyphosate), a fungicide Previcur Energy (propamocarb and fosetyl) and an insecticide Reldan 22 EC (chlorpyrifos-methyl). The antimicrobial effect was tested on a pure Bacillus cereus culture with an antibiogram, using concentrated pesticides and recommended concentrations. For the effect on growth, a soil-isolated microorganism suspension was created and added to a liquid medium, together with pesticides in recommended concentrations. After 24 h optical density at 600.4 nm was measured. The same suspensions at a 10-7 concentration were transferred to BHI agar plates. After 24 h a plate count was performed. The effect on basal respiration was investigated by measuring CO2 levels in an enclosed chamber, containing pesticide-treated soil. All pesticides in both concentrations showed an antimicrobial effect on Bacillus cereus. There was no significant difference in the effect of recommended concentrations between pesticides ($p > 0.05$), while Reldan 22 EC had the strongest and Previcur Energy the weakest inhibitory effect in concentrated form. Boom Efekt and Previcur Energy had an inhibitory effect on the growth of microorganisms isolated from soil, while Reldan 22 EC stimulated growth. All pesticides stimulated basal respiration. We hope these findings will contribute to a better understanding of how pesticides affect soil microorganisms and their functioning.

**Awards Won:**