



RESPIRATORY ACTIVITY OF AGRICULTURAL SOILS UNDER TRADITIONAL AND REDUCED TILLAGE

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Soil plays a major role in contributing to the atmospheric concentrations of greenhouse gases such as CO₂, CH₄ and N₂O. The fluxes of these gases are influenced by soil properties and environmental variables (soil moisture, temperature, structure). The aim of the paper was to determine the effect of soil cultivation (conventional versus reduced) on production and emission of greenhouse gases from cultivated fields. Investigations were carried out on experimental fields of the Institute of Soil Science and Plant Cultivation in Puławy (IUNG) localized in Grabów and Rogów. Gas samples were collected (weekly in the period of October 17. 2006 – January 16. 2007) from soil profiles at the depths of 15 cm, 30 cm, 50 cm and 70 cm. Parallely gas samples were taken from Plexiglas-covers situated on soil surface to determine greenhouse gases emission and analyzed chromatographically. Carbon dioxide concentration in soil profile increased with the increase of soil depth in both experimental objects. The opposite tendency was observed in the case of oxygen content. Neither N₂O nor CH₄ was detected. The amount of CO₂ production in soils was significantly higher in conventionally cultivated plots (P<0.001). Reduced cultivation resulted in reduction of CO₂ content in soil profiles in average by 33%. CO₂ emitted was correlated with CO₂ content at particular soil depths (except for CO₂ at 70 cm depth) and was slightly, not significantly higher in soil cultivated conventionally as compared to reduced cultivation.