

Jordan University of Science and Technology

Soil air permeability and carbon dioxide flux measurements from the soil surface.

Authors: Nusier, O. K., & Rousan, L. M.

Abstract: Air permeability has been recognized as an index of soil structure and used in attempts to characterize soil pore geometry. The importance of increased carbon dioxide in soil to agriculture comes from the direct effects of carbon dioxide (CO₂) on root respiration of agricultural crops. In this study, the soil air permeability and CO₂ flux values were obtained using two different apparatuses built and designed to measure air permeability and CO₂ flux. Air permeability was obtained in clay soil using two different aggregate sizes. The average values obtained were 9.55×10^{-28} and 1.78×10^{-27} cm² for the ,2-mm and 2- to 5-mm fractions, respectively. Carbon dioxide flux from the soil surface of no-till and bare plots under winter conditions was measured using another apparatus. The average CO₂ flux for the no-till plot was 2.88 g/m² -day and for the bare plot was 1.31 g/m² -day. These values were within the range of values obtained from other studies.