

SOIL RESPIRATION MEASUREMENT *IN SITU*

Soil respiration rate = amount of released CO₂ per time

CO₂ assimilated by autotrophic organisms during photosynthesis is released back to the atmosphere through respiration. Total ecosystem respiration consists of plant respiration and soil respiration. Soil respiration can be divided to root respiration and microbial respiration. Respiration rate depends especially by temperature and wetness (aerobic or anaerobic respiration), by substrate quality, soil pH and other environmental factors.

Principle:

CO₂ concentration changes are measured in short-time using infra-red gas analyser EGM-4 connected to the soil chamber (known volume) tightly closed to soil surface.

CO₂ concentration in the chamber is measured automatically every 5 seconds and the measurements take about 90 s. CO₂ flux rates (mg CO₂ m⁻² h⁻¹) is calculated from the linear change in CO₂ concentration in the chamber headspace over time with respect to the chamber volume and temperature.

Instruments:

Infrared gas analyser EGM-4, soil thermometer, soil hygrometer

Method:

Soil respiration chamber connected to EGM-4 is tightly closed to soil surface and the measurement is started. Soil respiration chamber is placed on free soil surface without vegetation. Select minimally 6 plots on the locality. Soil temperature in the different depth (5, 10 and 20 cm) and soil wetness is measured at the same time.