



Measuring carbon balances and greenhouse gas fluxes in soils at the Wolfson field laboratory

Cranfield University and Sercon have together developed an automated lysimeter array which is used to study carbon balances and greenhouse gas fluxes in soils under semi-natural field conditions with controlled temperature and moisture.

The Wolfson field laboratory comprises 24 hydrologically-isolated lysimeters connected to automated gas flux chambers, so that a complete material balance can be made. The layout provides for multiple soil types and treatments.



The soil monoliths are 0.8 m in diameter and 1 m deep, enough to be representative of field soil conditions. Each is equipped with systems for controlling moisture and temperature of the soil. Gases emitted from the surface can be monitored and dissolved solutes passing out of the bottom, temperature, moisture and solution at different depths are measured

The gas flux chambers (26-cm head space) fitted over the soil surface are pneumatically operated via the Sercon Calisto software. Gases accumulated in the head space during sampling are passed through a continuous loop to Sercon 20-22 and Cryoprep inlet in an adjacent building. This allows simultaneous analysis of the isotopes of CO_2 , CH_4 , and N_2O , at natural or enriched abundances.

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