

Trace Gas Concentration Measurements for Micrometeorological Flux Quantification. (A03-wagnerriddle090632-Oral)

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Abstract:

Agricultural systems can be sources or sinks of trace gases, and the quantification of this exchange is necessary when evaluating both the environmental impact of agricultural activities and the impact that atmospheric pollution from other sources have on agricultural production and sustainability. Micrometeorological methods are ideally suited for quantification of fluxes, but require determination of concentration gradients with height or concentration fluctuations at one height, with a level of precision and frequency that is often lacking in the available analytical techniques. However, recent developments in instrumentation, particularly in those based on infra-red spectroscopy, have enabled the real-time monitoring of trace gases concentrations. These advances will be reviewed, with particular emphasis on instrumentation for CH₄ and N₂O flux measurements from cropping and animal waste storage systems. Multi-plot air sampling systems for use with a micrometeorological approach, facilitating evaluation of several management practices will be discussed. Such an approach encompasses long-term effects, providing valuable information for mitigation of emissions of greenhouse gases from agriculture.

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Presentation Information:

Presentation Date: Monday, November 11, 2002
Presentation Time: 10:30 am

Keywords:

trace gases, micromet fluxes