UPCOMING SEMINAR
Department of Crop and Soil Sciences

Speaker: **Dr. Wilfred Otten**
Chair Biophysics of Soil Ecosystems
Director of the SIMBIOS Centre
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Dundee, UK

When: **Monday, October 31, 2011**
4:00 p.m. – 5:00 p.m.

Where: **271 PSS Building**

Title: **Emergent soil properties: critical behaviour in microbial invasions**

Abstract: Microbial interactions occur at small spatial scales. However, processes involving soil microorganisms are mostly observed at large spatial scales. Many biological systems express non-linear behaviour where small changes in the environment or microbial interactions can provoke large differences in system behaviour. Despite wide acceptance of thresholds amongst mathematicians and physicists, the concept of sudden changes remains counterintuitive and debated amongst biologists and ecologists who prefer to see soil as a buffered system. In this presentation we (1) present recent advances in the characterisation of soil microhabitats, and (2) demonstrate the existence of thresholds derived from percolation theory for the biological invasion of saprotrophic fungi as an example of non-linear and critical behaviour of biological systems. Through a series of experimental systems we demonstrate how small changes in pore network connectivity in soils, favourable sites or distribution of nutrients can lead to abrupt changes in larger scale behaviour, and discuss how the use of networks can be used as a suitable descriptor of soil pore network to understand biological invasions.