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Sessões Pôsteres - Resumos

Sessão: Estatística Aplicada em Agronomia e Biologia

**Título:** Nonlinear mixed modelling of soilwater retention curves

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**Resumo:** We present and discuss the use of nonlinear mixed (NLM) models to simulate soil water retention dynamics based on experimental data. Traditionally, such curve-fitting involved isolated and treatment-specific function fitting using fixed-effect nonlinear models. This has four main disadvantages: i) the experimental design is ignored; ii) comparison of SWRC between treatments via formal statistical tests is not possible due to the absence of an error structure that accounts for overall variance within treatments; iii) autocorrelation among random errors of moisture measurements in the same sample unit under different matric potentials is neglected, leading to incorrect quantification of model uncertainty; and vi) the soil-related spatial variability cannot be fully accounted for. Herein, we discuss advantages and limitations of the use of nonlinear mixed (NLM) model as an alternative to the usual isolated fitting. As an example, we present a study developed to investigate the effect of carbonised biomass (biachar) on the water retention capacity of a sandy soil in Nova Xavantina, Mato Grosso.

**Palavras-Chave:** *nonlinear models; uncertainty assessment; soil water retention dynamics.*