



Analysing the role of soil properties, initial biomass and ozone on observed plant growth variability in a lysimeter study

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This simulation study is based on a lysimeter experiment with juvenile beech trees (*Fagus sylvatica* L.) which were grown under ambient or doubled ambient atmospheric ozone concentrations.

The aim of the study was to analyze the role of differences in soil properties, differences in initial biomass and ozone impacts on observed plant growth variability at the 8 lysimeters of this experiment. For this purpose, we established a new simulation model based on the model system Expert-N by coupling soil water and nitrogen transport models with the plant growth model PLATHO, which was already tested and applied for juvenile beech. In order to parameterize the soil model, for all lysimeters soil hydraulic parameters as well as carbon and nitrogen stocks were measured.

Simulation results reveal that the observed decreased growth rates under elevated ozone are due to ozone impacts on plant growth, whereas the high plant growth variability between lysimeters is to a major part the consequence of differences in soil hydraulic properties. Differences in initial biomass are of minor importance to explain plant growth variability in this experiment.