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Impacts of a water stress followed by an early frost event on beech (Fagus sylvatica L.) susceptibility to Scolytine ambrosia beetles – Research strategy and first results

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Climate change tends to induce more frequent abiotic and biotic extreme events, having large impacts on tree vitality. Weakened trees are then more susceptible to secondary insect outbreaks, as it happened in Belgium in the early 2000s: after an early frost event, secondary Scolytine ambrosia beetles attacks were observed on beech trees. In this study, we test if a combination of stress, i.e. a soil water deficit preceding an early frost, could render trees more attractive to beetles.

An experimental study was set in autumn 2008. Two parcels of a beech forest were covered with plastic tents to induce a water stress by rain interception. The parcels were surrounded by 2-meters depth trenches to avoid water supply by streaming. Soil water content and different indicators of tree water use (sap flow, predawn leaf water potential, tree radial growth) were followed. In autumn 2010, artificial frost injuries will be inflicted to trees using dry ice. Trees attractivity for Scolytine insects, and the success of insect colonization will then be studied.

The poster will focus on experiment setting and first results (impacts of soil water deficit on trees).