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Effect of reduced soil water availability on productivity of short rotation coppice

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“Wood, in fact, is the unsung hero of the technological revolution that has brought us from a stone and bone culture to our present age.” Perlin and Journey (1991). Given its high-energy content and versatile use, biomass in a form of wood has been used for energy purposes since millennia and through times has been preferred source of biomass. Ever since, the production and use of woody biomass resources expands globally. Main drivers for its use as a source of energy are diversification and the mitigation of energy related greenhouse gas (GHG) emissions through partial substitution of fossil fuels. An alternative option for wood biomass sourcing from natural forests is short rotation woody coppice. Its productivity is largely dependent on the environment in terms of climatic conditions. Especially drought is the major constraint of woody biomass production involving serious economic consequences. In the central Europe, increased global radiation and air temperature together with decreased relative humidity increases the reference evapotranspiration resulting in an increased demand for soil water during growing season. For that reason, our field experiment was designed to evaluate impact of decreased soil water availability on productivity of poplar based short rotation coppice plantation during multiple growing seasons. Throughfall exclusion system based on plastic roof strips placed under the canopy was used to drain up to 70 % of the incoming rain water. Usual methods were used to assess the annual above ground biomass increment expressed in dry matter content. Not surprisingly our results show systematic decline in the productivity of plots subjected to decreased soil water availability but also considerable resilience of the drought-stressed trees which will be also discussed.
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