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Influence of stand density, thinning and elevated CO₂ on stem wood density of spruce

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Stem wood density (SWD) of young Norway spruce trees (*Picea abies* [L.] Karst.) growing at ambient (A variant, 350 μmol(CO₂)/mol) and elevated (E variant, A + 350 μmol(CO₂)/mol) atmospheric CO₂ concentration inside of the glass domes with adjustable windows was estimated after six and eight years of the cultivation. Stand density of two subvariants (s – sparse with ca 5,000 trees/ha and d – dense with ca 10,000 trees/ha) and thinning impact (intensity of 27%) on SWD and its variation along the stem vertical profile were investigated. After six years of CO₂ fumigation, stems of sparse subvariant had about 10% lower values of SWD comparing to dense ones, although the difference was not statistically significant. In 2004 (two years after thinning), the SWD values were higher in all subvariants along the whole stem vertical profile. This increase was more obvious in E variant (about 6% in d subvariant and only 3% in s subvariant). The highest increase of SWD values was found in Ed subvariant, particularly in the middle stem part (about 8%, statistically significant increase).

Keywords:

elevated CO₂; *Picea abies*; stand density; stem wood density; thinning

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