

GENERAL INFORMATION

author(s)	Ganne B
year	1994
English title	Effects of global change on the primary production and the conversion of energy in forests
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reference	Msc thesis, Ghent University, Ghent
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type	dissertation (d2)
ecosystem service	supporting – photosynthesis
keywords	primary production, biomass, C
taxa	<i>Populus x interamericana</i> cv. 'Beaupré' – <i>Quercus robur</i> – <i>Pinus sylvestris</i>
project	PhD Lootens
supervisor	Lemeur R
institution	Laboratory of Plant Ecology
document	hardcopy
data	

MATERIALS & METHODS

study area	3e, 5n (scientific zone)
time period	1991–1993
goal	Quantification of the effects of a doubling in CO ₂ concentration on the primary production of tree species, for plants in controlled growing conditions with high CO ₂ levels, for plantation seedlings and adult model trees growing at ambient CO ₂ levels.
set-up	model tree oak (Aelmoeseneie), planted oak seedlings and poplar cuttings <ul style="list-style-type: none"> - plantation of 100 m²: 60 <i>Quercus</i> seedlings planted in spring 1991, 60 poplar cuttings planted in spring 1992 - 7 model trees of oak (65 years old)
data collection	oak seedlings <ul style="list-style-type: none"> - destructive sampling at the end of growing season 1991 (8 trees), 1992 (4 trees), 1993 (8 trees) - 4 trees sampled during the growing season of 1992 poplar seedlings <ul style="list-style-type: none"> - destructive sampling at the end of growing season 1992 (4 trees), 1993 (10 trees) measured variables for the plantation seedlings: tree height, diameter, dry mass of stems, roots measured variables for the model trees: stem diameter (at 1.5 m), tree height
remarks	

RESULTS

The effect of a doubled CO₂ concentration on the photo-energetic conversion efficiency of stem wood (= the ratio between the increase in dry mass and the absorbed photosynthetically active radiation) is larger for trees with an inherently higher conversion efficiency such as poplar than for inefficiently converting trees species such as pine. Similar patterns were found for primary production and the increase in stem biomass.