GENERAL INFORMATION

author(s)	Vanhoutte G
year	1998
English title	Study of the seasonal dynamics of the stomatal and crop resistance in a mixed broadleaved forest
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ecosystem service	regulating – water cycle
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taxa	*Fraxinus excelsior*, *Fagus sylvatica*, *Corylus avellana*, *Sorbus aucuparia*
project	
supervisor	Lemeur R, Samson R
institution	Laboratory of Plant Ecology
document	pdf_short, hardcopy at the Laboratory of Plant Ecology
data	

MATERIALS & METHODS

study area	5n (scientific zone)
time period	July–September 1997
goal	Gain insight into the stomatal dynamics
set-up	Measurements of stomatal resistance for two species (beech, ash), at different heights of the canopy, throughout the day, at different days during the growing season.
data collection	measuring tower: shortwave radiation, PAR (hourly mean), air temperature (30 min mean), air humidity, precipitation, throughfall, stemflow (hourly mean), soil water potential (hour) porometer (Delta-T, Walz): stomatal resistance - beech (level 1, 2, 3), ash (level 3): 5 leaves per level, marked - 2 hazel, 3 rowan shrubs (ground level): 7 leaves per species - 3 brambles: 7 leaves 1 sunny and 1 cloudy day per month: 6 days in total
remarks	

RESULTS

The data obtained with the two porometers were different. PAR and temperature increased with height in the canopy. The leaf temperature was 1–2 °C lower than the air temperature. The transpiration of ash was higher than for beech.

The curve of the changes in stomatal resistance during the day was inverse bell-shaped: the stomata closed at noon, when temperature and radiation were highest. The stomatal resistance increased with height in the canopy. The minimum stomatal resistance was 405 s/m (beech, level 1), 274 s/m (beech, level 2), 174 s/m (beech, level 3), 107 s/m (ash). The variability in stomatal resistance was lower for ash, and the stomatal resistance of ash increase slightly between July and September (probably because of the dry period in August).

The minimum stomatal resistance was higher, i.e., 515 s/m (hazel) and 468 s/m (bramble), in the understory, but the variation during the day was smaller than for the trees.

The resistance values measured with the Walz porometer were lower than the ones measured with the Delta-T porometer.

None of the models used gave reliable results if the model parameters were not adjusted to the current dataset. Light intensity and the saturation deficit of the air had the largest effect on the stomatal dynamics, the impact of air temperature was low. Crop resistance was calculated with a one-layer model and a multi-layer model; the models gave different results. Little differences in stomatal and crop resistance were found during July-September.