GENERAL INFORMATION

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MATERIALS & METHODS

study area	5n (scientific zone)
time period	May-December 1996
goal	The quantitative determination of the LAI (dynamics) of two mixed forest stands, the comparison of 2 indirect and 1 direct methods for determining LAI, regression equations between the indirect and direct LAI measures
set-up	2 forest types: oak-beech vs. ash-dominated 3 different methods for measuring LAI: hemispherical photography, LAI-2000 Plant Canopy Analyzer, litter fall collected in litter traps
data collection	hemispherical photographs - 6 sample points in the oak-beech forest, 6 sample points in the ash-oak forest - 3 photographs per sample point (under, normal, overexposed): underexposed picture used for further processing - 14 photographs per point between May-December - HEMIPHOT LAI-2000 PCA - 3 transects + 1 transect - 11 sample points + 20 sample points - **6** sample dates (September-December) leaf fall traps - 30 per stand - **collected every 2 weeks** (August – December) - Fresh and dry mass (per species) + branch/fruit biomass - Subsample: leaf area per species (Portable Area Meter)
remarks	Stand thinning in the oak-beech plot in 1995: beech and larch. Map with sample points Table 1 shows the LAI for each sampling date

RESULTS

Hemispherical photography and LAI-2000 PCA underestimated LAI if the leaf distribution in the canopy deviated from the random distribution (oak-beech forest). In the ash stand, with a nearly random leaf distribution in the canopy, the LAI-2000 measures were closely related to the direct measurements of LAI

via the litter traps. Hemispherical photographs underestimate LAI at high LAI values and overestimate LAI at low LAI values; the deviation is larger than for the LAI-2000 PCA.

Subdominant trees and shrub layer trees start leaf abscission later than overstory trees. The LAI of ash is lower than the LAI of beech.

	ash	**oak-beech**
hemispherical photographs: max LAI	4.05 (24 July)	3.68 (18 September)
LAI-2000: min LAI	1.19 (29 December)	0.9 (29 December)
leaf traps: max LAI	4.53 (15 August)	5.52 (15 August)
leaf traps: start leaf abscission	10 October	10 October
leaf traps: max LAI shrub layer LAI	0.91	0.21

Hemispherical photography and the LAI-2000 PCA have similar drawbacks: weather conditions are important, Plant Area Index is measured instead of LAI. The exposure time of the film is also important for the hemispherical photography. LAI-2000 measurements with a wide angle of view are likely to underestimate the LAI.