

GENERAL INFORMATION

author(s)	Bosmans M
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project	
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data	

MATERIALS & METHODS

study area	5n (scientific zone: oak-beech part)
time period	July–December 2004
goal	Investigate the useability of the TRAC sensor and the reliability of the measured LAI and crown architecture data through the comparison of different ecosystems and different methods of LAI measurement.
set-up	LAI methods: TRAC, destructive (direct) method, Sunscan and hemispheric photographs (indirect methods) 4 locations: Aelmoeseneie forest (old, mixed broadleaved), Zwijnaarde plantation (young, broadleaved), coniferous stand Blekkerbos, maize field
data collection	maize field <ul style="list-style-type: none"> - 2 transects (100 m), marked each 20 m: TRAC, Sunscan at 25 cm, hemispherical photographs at 25 cm - 1 plot of 3 m x 3 m: destructive: all leaves sampled, top and bottom diameter of stems measured, leaves counted, leaf surface measured - hourly measures with the TRAC on 16 and 17 September plantation <ul style="list-style-type: none"> - plots with poplar (2), willow (1), birch (1), sycamore (1) - 3 transects per plot, marked each 5 m - TRAC, Sunscan, hemispheric photographs - destructive in 1 plot of each species: leaves of 2 trees harvested per 1m layer, stem diameter at 30 cm, leaves counted, leaf surface measured Aelmoeseneie forest <ul style="list-style-type: none"> - 1 transect of 50 m between N3 and I4, marked each 10 m - Sunscan, TRAC, hemispheric photographs at 80 cm height - 20 repetitions of the measurements with the Sunscan Blekkerbos <ul style="list-style-type: none"> - 3 coniferous plots (douglas, douglas&Norway spruce), 1 Castanea coppice - 2 transects per plot: 80 m in plot 1 (20 m marks), 50 m in the other plots (10 m marks) - Sunscan, TRAC, hemispheric photographs at 80 cm
remarks	map with location transect in the scientific zone on p 38

	hemispheric photographs: 5 photos per measuring point: underexposed (two levels), normal exposition, overexposed (2 levels), photographs taken early morning, evening or at uniformly cloudy days, calculation of LAI with CAN_EYE version 3.2.2
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RESULTS

Too few trees sampled at the plantation with the destructive method to yield reliable LAI results.

Each of the methods used has some assets and some drawbacks; the usefulness of the method depends on the sampled ecosystem and the data required.

method	+	-	requirement
destructive	reference method	time-consuming, cannot be repeated during the growing season	
Sunscan	fast	underestimation of LAI only LAI difficulties in stands with high vegetation	direct sun
hemispheric photography	photos can be archived other variables can be calculated	overestimation of LAI slow (photos have to be processed) data produced in html format	no direct sun
TRAC	LAI ~ destructive method	slow, difficult further processing of data required	direct sun

The LAI determined by the TRAC sensor was similar to the LAI determined based on the destructive method. The Sunscan LAI was 60–70 % of the LAI determined by the destructive method. There was no clear correlation between the LAI determined based on the hemispherical photographs and the TRAC sensor.

Protocols are needed for measuring LAI.