

GENERAL INFORMATION

author(s)	Van Camp N
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ecosystem service	regulating – climate
keywords	C-sequestration – C-content
taxa	<i>Fraxinus excelsior</i> – <i>Quercus palustris</i> – <i>Sambucus nigra</i> – <i>Corylus avellana</i> – <i>Acer pseudoplatanus</i>
project	Msc thesis Van Camp
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institution	Faculty of Agricultural and Applied Biological Sciences, Laboratory of Forestry
document	hardcopy, pdf
data	bijlagen: biomass and C content of stems and branches, soil C content

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The C sequestration was quantified for a pasture and two young forests (27 y – *Fraxinus excelsior*, 25 y – *Quercus palustris*) on former pasture lands. Three model trees were sampled per stand. The C content of leaves, twigs, branches and stems was determined. In addition, the C concentration in the LFH litter layers and in the soil were measured. The C sequestration (in ton C/ha) was 35 % higher in the ash stand, as compared to the meadow, and 8 % lower in the oak stand. The C content decreased with soil depth, and the impact of afforestation on C content was only visible in the upper soil layers after 25 years.

MATERIALS & METHODS

study area	5k, 3b
time period	litter samples before leaf litterfall in autumn (October)
goal	Quantification and comparison of the C sequestration capacity of pasture land and young forest stands on former pasture lands
set-up	<ul style="list-style-type: none"> - ash (0.25 ha), oak (0.525 ha), pasture land - tree layer, shrub layer, litter layer and soil (only soil for the pasture land) - 3 model trees per species harvested (tree with arithmetic mean diameter dm, dm - sd, dm + sd): C content leaves, twigs, branches, stems - shadow crown vs. light crown - shrub layer: transect 5 m x 100 m oak – 5 m x 50 m ash: count of individuals, count of shoots and d measures for 10 individuals – 3 model shoots per species (3 random saplings for sycamore) - humus layer: LFH + dead wood (d < 1.5 cm) in 12 0.5*0.5 m plots per stand - soil sampling up to 1 m depth at 12 sample points per stand (0-5, 5-15, 15-50, 50-100 cm) - soil density sampling: 4 sample points per stand (2.5, 10, 30, 75 cm)
data collection	<ul style="list-style-type: none"> - dbh of all trees in the study plots, height of 10 trees - all leaves: fresh weight – 100 leaves: fresh weight + oven-dry (80°C) mass - twigs (d < 1.5 cm): fresh weight - branches/stems (1.5 cm < d < 4.5 cm < d < 7.5 cm): fresh weight – oven-dry weight

	subsample - stems & large branches: volume (d each 0.5 m) + density (wedges each 1 m: dry and fresh weight, volume) - sycamore saplings: total weight - soil samples (4 per stand): Kopecky rings: fresh & oven-dry weight (density) - LFH-layers: fresh and oven-dry weight - soil samples (12 per stand): C concentration Walkley & Black
remarks	ash planted in 1968, oak in 1970 roots: data from literature p 44: scheme transects

RESULTS

stand	ash	oak	meadow
total C (ton/ha)	173.13	118.01	128.53
trees	80.22	37.7	
shrubs	0.19	12.06	
litter	2.48	8.19	
roots	16.08	9.94	
soil	74.16	50.12	128.53

After 25 years, the effect of afforestation on the C content of the soil was only visible in the top soil layers.