

GENERAL INFORMATION

author(s)	Thomaes A
year	2001
English title	The impact of soil and competition on the distribution of forest understorey plants typical of ancient forests in young forest stands
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taxa	<i>Anemone nemorosa</i> , <i>Hyacinthoides non-scripta</i> , <i>Lamium galeobdolon</i> , <i>Lonicera periclymenum</i> , <i>Paris quadrifolia</i> , <i>Primula elatior</i> , <i>Stellaria holostea</i> , <i>Aegopodium podagraria</i> , <i>Ranunculus ficaria</i> , <i>Urtica dioica</i>
project	Msc th Thomaes
supervisor	Lust N
institution	Laboratory of Forestry
document	hardcopy, pdf
data	

MATERIALS & METHODS

study area	5n (scientific zone)
time period	1999-2000
goal	<p>Investigate the impact of high soil nutrient concentrations and competition with competitive herb species on the colonization of forest understory species typical of ancient forests.</p> <ul style="list-style-type: none"> - Is germination affected by the differences in soil development under different tree species? - Is competition with competitive herbs influenced by the tree species of the stand? - Study of dispersal patterns in the Muizenbos forest in relationship with competition and light availability
set-up	<p>germination experiment</p> <ul style="list-style-type: none"> - 7 herb species (<i>Anemone</i>, <i>Lamium</i>, <i>Lonicera</i>, <i>Paris</i>, <i>Primula</i>, <i>Stellaria</i>, <i>Hyacinthoides</i>) - soil (0-5 cm, 2 sample spots per stand) from below 4 tree species (<i>Acer pseudoplatanus</i>, <i>Alnus glutinosa</i>, <i>Fagus sylvatica</i>, <i>Populus x euramericana cv. Robusta</i>) in the Mortagne forest (27 yr old) - soil collected in October 1999 - 64 pots per soil type, 2 kg soil per pot (256 in total) - seeds collected in the Aelmoeseneie forest (first 6 species) and the Raspaille forest (last species) - 8 pots per understory species (+ control) and soil type, seeding in September - pots next to the level II plot in the Aelmoeseneie forest, aboveground - in situ seeding in the Mortagne forest <p>competition experiment</p> <ul style="list-style-type: none"> - planting of rhizomes of <i>Anemone</i> with/without competitors <i>Aegopodium</i>, <i>Ranunculus</i>, <i>Urtica</i> on 18/03/2000 - all species collected in the Aelmoeseneie forest - same 4 soil types (0-10 cm)

	<ul style="list-style-type: none"> - in 8 large concrete containers at the parking lot of the laboratory with shade cloths to mimic forest climate conditions dispersal study <ul style="list-style-type: none"> - Muizenbos
data collection	germination experiment <ul style="list-style-type: none"> - counting germinated seeds (8/11/99, 3/12/99, 11/02/00, 29/02/00, 18/03/00, 10/05/00, 17/05/00, 12/07/00 – only for <i>Lamium</i>) - soil analysis for 8 pots per soil type - chemical analysis of the aboveground biomass of <i>Lonicera</i> competition experiment <ul style="list-style-type: none"> - 28/06/2000: measurement vegetative/generative characteristics competitors - 09/04/2001: measurement vegetative/generative characteristics <i>Anemone</i> - 31/07/00-02/08/00: light measurements above/below shade cloths and in the Aelmoeseneie forest dispersal study <ul style="list-style-type: none"> - 9 transects with plots of 5 m x 5 m at the northern border of the forest - vegetation inventory in May 1997 by Luc De Keersmaecker
remarks	The competition experiment will be monitored further, and Thomaes mentions a fertilizer experiment in the forest. pot experiment in 5n (scientific zone) – collection seeds in ?

RESULTS

Acer soil had high P levels; *Alnus* soil high N levels and low pH and K values; *Fagus* soil had low N concentrations; *Populus* soil had low N, but high base saturation and pH levels.

An *Anemone* seed weighs ca. 1.84 mg; *Hyacinthoides* seed 4.08 mg; *Lamium* seed 2.73 mg; *Lonicera* 6.57 mg; *Paris* 0.83 mg (possibly empty/deaf); *Primula* 0.65 mg; *Stellaria* 2.91 mg. Germination percentage was correlated with seed weight. *Anemone* only germinated after 2 years, and the germination percentage was very low (3.75 %). *Hyacinthoides* germinated during the entire spring, germination percentage was 11 % (9.5 % still alive at the end of the experiment). *Lamium* germinated late (May), overall germination 12.5 % (10 % alive). *Lonicera* germinated mainly in early spring, 58 % germination (41 % alive). No germination for *Paris*. *Primula* germinated only in *Populus* soil; overall germination 18.9 % (16.5 %); *Populus* soil germination was 75.6 % (65.5 % alive); germination in late winter. *Stellaria* germinated in autumn and spring, germination 24 % (15.5 % alive). No difference in germination between the soil types for *Anemone*, *Hyacinthoides*. Little difference for *Lonicera* and *Stellaria*. *Lamium* germinates best in *Acer* and *Fagus* soil.

Root weight was positively correlated with the aboveground vegetation variables. Soil type affects plant height and the number of flowers. Best growth in *Populus* soil. Competition affects height growth of *Anemone*. These results are only about the first spring after planting!

CONCLUSIONS

The germination of the forest understorey species was not hindered in the post-agricultural forest soil. The germination was best in the *Populus* soils. Competitive species are most abundant below *Populus*.