

GENERAL INFORMATION

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| author(s) | Speleers L |
| year | 1987 |
| English title | Regeneration of <i>Quercus rubra</i> L. and <i>Quercus robur</i> L. in some stands of the Aelmoeseneiebos |
| original title | Natuurlijke verjonging van Amerikaanse eik (<i>Quercus rubra</i> L.) en zomereik (<i>Quercus robur</i> L.) met bijzondere aandacht voor enkele bestanden van het Aelmoeseneiebos te Gontrode |
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| ecosystem service | supporting – forest dynamics |
| keywords | regeneration |
| taxa | <i>Quercus rubra</i> – <i>Quercus robur</i> |
| project | |
| supervisor | Lust N |
| institution | Laboratory of Forestry |
| document | hardcopy |
| data | |

MATERIALS & METHODS

| | |
|-----------------|---|
| study area | 5g, 5i, 5j, 5l (& 5c, 5d, 5f, 5n, 6a for seed rain) |
| time period | 1986-1987 |
| goal | |
| set-up | |
| data collection | <p><u>seed rain</u></p> <ul style="list-style-type: none"> - 15 traps (ø 37.5 cm) in stand 6a (red oak), 19 traps in stand 5c (pedunculate oak) placed in August, checked regularly for acorns - 5 plots of 0.5 m² per stand in December: acorns and beech-nuts collected, identified and classified according to their health condition (stand numbers 1988: 1-10 – stand numbers 2006: 6a (=1), 5n (=2+3), 5l/5j (=4+5+6), 5i (=7), 5d (=8), 5c (=9), 5e/5f/5g (=10)) <p><u>seedling growth ~ light</u></p> <ul style="list-style-type: none"> - 10 seedlings of red/pedunculate oak in both light/shade conditions: morphological characteristics (see fig. 11 p 56) + biomass of the different parts of the seedling <p><u>regeneration areas</u></p> <ul style="list-style-type: none"> - 9 rectangular plots with 1 m x 1 m subplots - position, height, estimated age - August/September 1986, re-measurement July 1987 (3 plots had been destroyed) - Crown projections above the plots were drawn <p><u>seedling characteristics</u></p> <ul style="list-style-type: none"> - 50 one-year-old, 15 two-year-old, 15 three-year-old seedlings of both red oak and pedunculate oak - morphological characteristics, biomass |
| remarks | |

RESULTS

Seed rain

Seed rain of acorns starts in August. Most acorns of red oak fell before 8 October while the seed rain of pedunculate oak was more evenly distributed over time and lasted until the end of October. The % of sound acorns of pedunculate oak was low. The percentage of worm-eaten acorns was much higher for pedunculate oak than for red oak. A large number of acorns was already germinating. The number of acorns was strongly correlated with basal area and/or stem density for red oak, ash, and sycamore.

Seedling growth

Seedlings of red oak grew better in shaded conditions. Biomass is larger in shaded conditions; the ratio above/belowground biomass is similar; the ratio root/shoot and leaf biomass/total biomass is higher in shaded conditions. Total leaf area was higher in shaded conditions as well as the ratio leaf area/total biomass.

Seedlings of pedunculate oak grew less well in shaded conditions, but can regenerate below itself. Biomass, leaf biomass, and leaf area are smaller in shaded conditions. All dimensions are smaller in shaded conditions, except for the length of the stem.

Regeneration plots

Seedlings of red oak occur more often under a closed canopy and most frequently under red oak. Sycamore and red oak were more abundant than seedlings of pedunculate oak. Species, height, and age distributions are compared between the plots. The groups of regeneration are characterized by a high intern dynamics. Seedling mortality was higher for pedunculate oak (82 %), decreased with seedling age, was higher under red oak canopy and at the bottom of ditches. Seedlings of red oak were up to 10 years old while pedunculate oak seedlings were up to 3 years old.

Seedling characteristics

Three-year old seedlings were smaller than 25 cm for both species. The height growth in the second and third year was lower than in the first year (growth crisis). The diameter and diameter growth were larger for pedunculate oak seedlings. Seventeen % of pedunculate oak seedlings keep their acorns till the third year. Pedunculate oak more often forms a root system with multiple roots. The increase in seedling biomass is larger between the second and third year. The increase in biomass is mostly because of the increase in root biomass.

CONCLUSIONS

The timing of thinnings to open up the canopy should be adjusted to the regeneration of the species wanted. Selection and management of the seedlings should start early on. As root development is important for growth and survival of the seedlings, management should aim at a well-suited soil structure and water supply.