

Effects of stand density on growth and form of 24-year old *Quercus robur* and *Fraxinus excelsior* grown in Nelder experiments

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To examine growth dynamics and qualitative development of *Quercus robur* and *Fraxinus excelsior*, circular Nelder plots of pedunculate oak and common ash planted near Freiburg (Germany) in 1986 were repeatedly measured over a 22 year period. Within the three complete Nelder circles of each species, original planting densities ranged from 1,020 to 30,780 seedlings ha⁻¹ and growing space from 0.33 to 9.8 m² (without inner- and outermost buffer rows). Owing to significant differences in density-dependent mortality, the species exhibit distinctly different growth patterns. The high survival rates of ash inhibited height and diameter growth of individuals at greater planting densities. In contrast, high mortality at high initial stand densities in the oak plots resulted in less differentiation in total height. Overall, increased spacing lead to an increase in diameter at breast height and relative crown length. Planting densities did not have a clear effect on stem form and quality for either species. However, with decreasing planting densities, the proportion of crowns with bushy forms and reduced apical dominance increased. Number and diameter of dead and living branches along the lower 6-m section of the trunk increased with growing space reflecting a declining self-pruning efficiency.

The results show, that the two species require different planting densities and/or spacing treatments of very dense natural regeneration. The results are further discussed in terms of the quality of the regrowth stands and selection potential.

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