Qualification – dimensioning silviculture: effect on growth patterns of European beech (*Fagus sylvatica)*

Report on field work related to Master's thesis

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Summary of the project

The Qualification - dimensioning (QD) silviculture has developed as a method focusing on individual trees to produce veneer quality logs in a short time while preserving ecological functions and stability of the stand and providing adaptability of forest management in aspects of climate and social changes.
In contrast to mechanized large scale forest management in Boreal region, this method provides possibility of diverse forest structure and species composition, increased mechanical stability and economic viability with low economic input. The method could therefore be an interesting alternative for private forest owners who prefer un-mechanized work with low costs and continuous cover forestry with diverse forest products.
Although the experiment was conducted on beech, the method can be applied to any (combination of) tree species as it focuses on each crop tree individually. To achieve good adaptation to local conditions and lower the costs, the method relies on natural regeneration. The early development and qualification (natural pruning of lower branches) of crop trees happens in clumps to localize the work from the beginning and thus allow the natural dynamics to assist in the process of selection. Later, as the crop trees are well pruned, the regular thinnings are applied to release the crown and allow fast diameter growth.

The aim of the study was to assess the influence of the Qualification – Dimensioning (QD) silvicultural method on growth patterns of beech. The objective of the field work was to collect data in five forest stands in Blieskastel municipality in Saarland, western Germany.
During the 3 weeks with we measured horizontally projected crown area, crown base and height of the sample trees. In circular plots diameters of trees and stumps surrounding the crop trees were measured to assess structure and composition of the stands. An additional objective in the research plan was to assess the tree species diversity of the stands. Unfortunately, that was not applicable since the sample was too small and not diverse enough.

The data analysis showed that diameter increment of the QD crop trees is significantly higher than the increment in the control plots, as expected. We modelled the growth and the increment correlates well with horizontal projection of crown area. We also compared the diameter distribution of trees on circular plots and found that the treated plots show skewed J-formed distribution that is more common in selection forests, rather than the control, more resembling the distribution in even-aged stands and was found in control –non treated– plots.

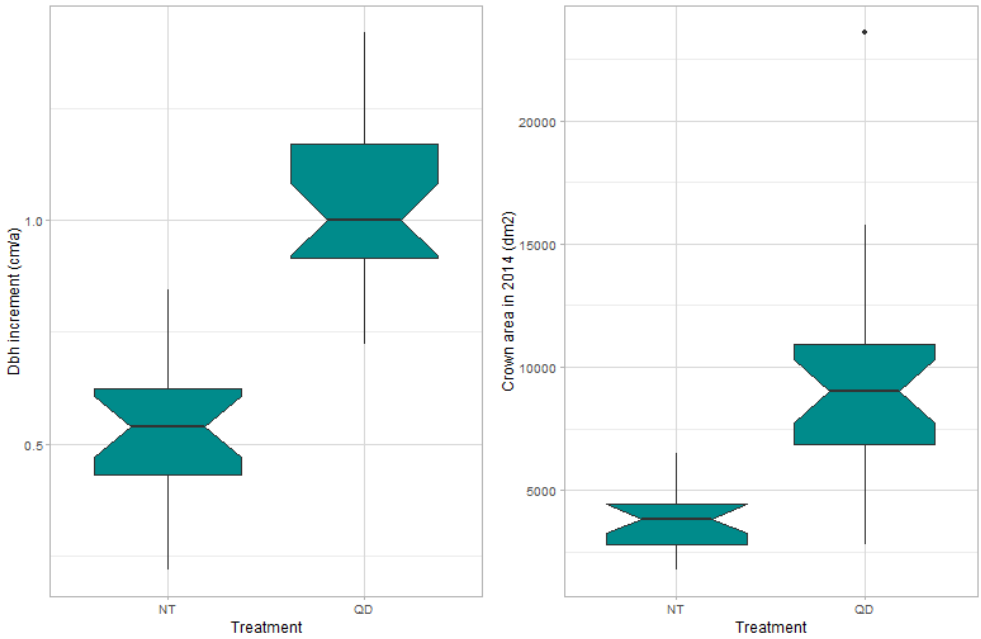

Figure 1 Comparison of diameter growth and crown size in QD-treated and control trees.

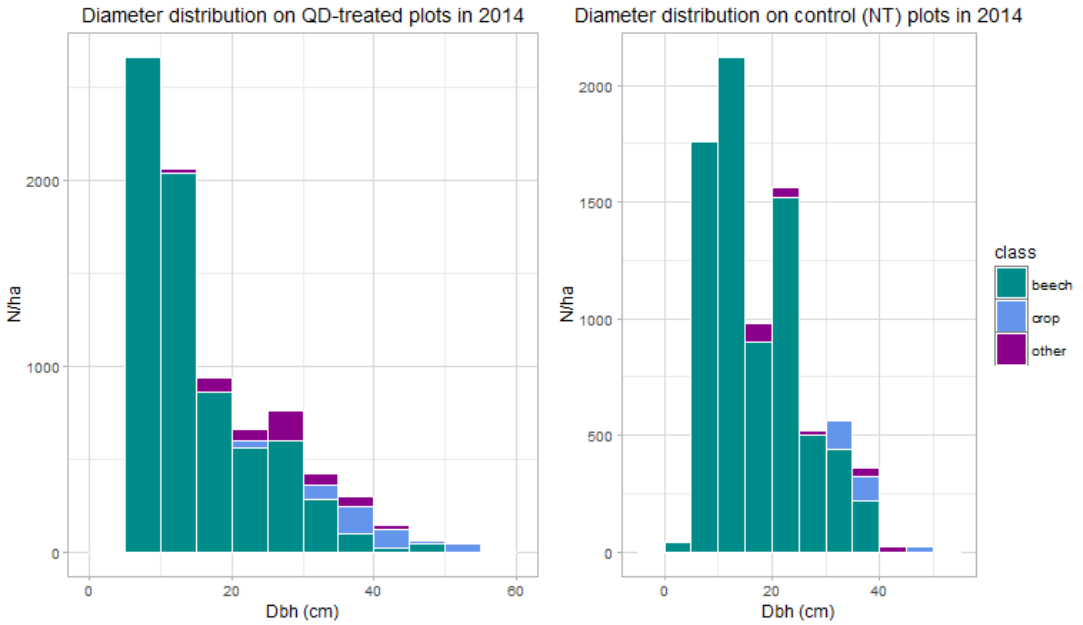

Figure 2 Comparison of diameter structure in QD-treated and control plots.