



Towards a more nature-based silviculture: effects of experimental forestry treatments on forest regeneration in an oak-hornbeam stand

(Poster)

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Conservational concerns are increasingly important in timber production forest management. Besides clear-cutting and shelterwood forestry systems the more nature-based continuous cover forestry is spreading in temperate forests. To evaluate the success of tree regeneration in various forestry treatments is relevant both from conservational and forestry aspects.

We studied the mortality and growth of planted seedlings within the framework of a comprehensive field experiment (Pilis Experiment). Five treatment types were investigated: clear-cutting (diameter: 80 m), retention tree group within the clear-felled area (diameter: 20 m), preparation cutting (30% of the dominant trees and the whole secondary layer were felled), gap-cutting (diameter: 20 m) and uncut control. The study was conducted in a mature sessile oak-hornbeam forest stand in Northern Hungary, in a complete block design with six replicates. Altogether 750 seedlings, i.e. 150 individuals of five tree species (sessile oak - *Quercus petraea*, Turkey oak - *Quercus cerris*, beech - *Fagus sylvatica*, hornbeam - *Carpinus betulus* and European ash - *Fraxinus excelsior*) were planted. The effect of browsing was completely excluded by the fencing of the plots. Height, stem diameter, shoot number and leaf area of each individual were measured yearly. Here we compare the development of the seedlings in the different treatments, based on the height and shoot number increment during the first three years after the interventions.

Mortality of the seedlings was the lowest in the gaps, and the highest in the control. Height growth of beech, shoot number increment of sessile oak, and both variables of the other species were significantly affected by the treatments. Growth of beech, hornbeam and ash was the largest in the gap- and clear-cutting; their height increased the most intensively in the gap, while shoot number increment did not differ between the gap and the clear-cutting. The shoot number of oaks increased significantly more in the clear-cutting compared to the other treatments; however, their height growth was not significantly greater there. The development of seedlings in the preparation cutting and retention tree group was weak, similarly to the control sites.

Considering both the survival and development of the seedlings, for shade-tolerant species gap-cutting proved to be the best treatment, and for oaks it was similarly suitable than clear-cutting. Continuous cover forestry is much favourable from conservational aspect than rotation forestry. Our short-term result confirm that it also ensures the convenient tree regeneration, thus it can be a good alternative for the industrial forestry to achieve multiple (management and conservational) purposes.

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