Effect of annual rate on Optimisation of harvest-regeneration systems in a mixed temperate forest of Central Europe

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Forests belong to the most important ecosystems in the world. In the past, forests were used mainly for the fulfilment of production functions, but nowadays forests are perceived as multifunctional production systems, which provide various types of products and services. The fulfilment of forest functions is significantly influenced by harvest-regeneration variant, whereby the annual rate is the most important decision factor that can influence the optimal management method. The aim of this work is to determine the influence of the annual rate value on the fulfilment of production and non-production functions during the regeneration cutting in a modelled forest stand. The growth of the forest stand was predicted with the growth simulator of SIBYLA by simulating the application of more than 450 different variants of 4 regeneration systems. The selection of the optimal harvest-regeneration variant with different values of annual rate was performed using the Reasonable Goal method and Interactive Decision Maps. The results of the simulation showed the significant influence of the annual rate on the selection of the optimal harvest-regeneration variant, while at low annual rates the optimal regeneration variants are close-to-nature methods with long rotation and regeneration periods. With the increase of the annual rate, the lengths of rotation and regeneration periods decrease and close-to-nature regeneration methods are replaced by clear cutting methods.